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Educations for … in French Language Context: What Contribution of the Social Sciences?

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Articles

Jean Simonneaux, Nicole Tutiaux-Guillon, Alain Legardez

Éditorial: éducations à ... et sciences sociales, perspectives des recherches francophones

1 Introduction

Dès la fin du 19e siècle, certaines ‹ éducations à › ont pu être introduites dans les enseignements soit dans les disciplines existantes (l'éducation à la santé et à la salubrité par exemple s'insère tant dans les sciences que dans l'instruction ménagère) soit en parallèle (l'éducation antialcoolique) (Freyssinet-Dominjon, Nourrisson 2009; Lebeaume 2010; Nourrisson, Parayre 2012). Parallèlement nombre de systèmes scolaires ont introduit sous des formes diverses une éducation à la citoyenneté. Mais depuis la fin du 20e siècle, l'introduction d'éducations à semble de nouveau d'actualité et affecte, inégalement, toutes les cultures. Les dénominations et les formes en sont variées (éducation à la santé, éducation aux droits de l'homme, éducation à la paix, éducation au développement durable, éducation à la responsabilité, éducation à l'entrepreneuriat, éducation à la citoyenneté). Les ‹ éducations à › peuvent avoir un caractère transversal, transdisciplinaire ou parfois a-disciplinaire, ou être rattachées à différents champs disciplinaires, soit à l'intérieur de disciplines installées soit comme enseignement complémentaire dans un système disciplinaire. Les sciences humaines et sociales sont ici doublement concernées: d'une part, versant enseignement, elles peuvent être les références des disciplines scolaires concernées (l'histoire, la géopolitique, la sociologie, l'économie...), d'autre part, versant recherche en éducation, elles peuvent questionner et éclairer ces changements (sociologie de l'éducation, philosophie de l'éducation, didactiques...).

Ce numéro se propose d'entrer dans une réflexion qui pose les ‹ éducations à › non comme un donné, mais comme un objet que àl'on peut déconstruire, rendre intelligible de différents points de vue, voire aider à construire comme domaine d'enseignement. Ainsi l'éducation à la paix peut-elle être envisagée du point de vue du contexte géopolitique (prend-elle les mêmes finalités et les mêmes contenus dans un État où la guerre est un souvenir lointain ou dans un État où les conflits récents sont encore à vif ?), du point de vue de l'histoire (dans quels contextes historiques introduit-on ce type d'éducation? Y a-t-il eu des antécédents par exemple entre les guerres mondiales ?), du point de vue des didactiques (quel curriculum? quels apprentissages sont en jeu? quelles situations sont propices à leur construction? quels obstacles rencontrent les enseignants et les apprenants? comment en évaluer l'efficacité – le risque de guerre, pierre de touche de la réussite de cette éducation, n'étant ni programmable ni souhaitable ?). C'est ce point de vue didactique qui domine dans ce numéro. Doussot examine en quoi la géographie contribue à la formation d'un citoyen écologiquement responsable et Richit en quoi les sciences sociales aident les élèves à construire leur orientation. L'article de Barthes et Jeziorski insiste sur les risques d'une fragmentation des enseignements et de l'absence d'approche systémique d'une éducation à au niveau de l'université. Panissal et Brossais argumentent le rôle effectif du débat dans l'apprentissage d'une citoyenneté scientifique. Les sciences humaines et sociales posent aussi la question centrale de tels projets d'éducation à: quel être humain, quel-le acteur-actrice social-e, quelle personne, quel-le citoyen-ne

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veut-on former? C'est aussi la question sous-jacente à nombre d'articles, par exemple lorsqu'il s'agit de questionner la formation de l'esprit critique (Barthes, Jeziorski; Cardin, LeVasseur; Doussot) ou plus largement celle du citoyen (Cardin, LeVasseur; Panissal, Brossais). Si la plupart des articles prennent directement en compte les ‹ éducations à › prescrites et effectivement mises en œuvre, la centration sur les disciplines n'exclut pas de contribuer à une réflexion sur les projets éducatifs englobants: en interrogeant les cadres sociaux de l'enseignement de l'histoire et les légitimations à l'œuvre pour cet enseignement, LeVasseur et Cardin posent celle-ci comme une éducation au vivre en société qui déborde largement le cadre initial de la discipline scolaire.

Même si les articles de ce numéro sont loin de s'y limiter, nous appuyons cette introduction sur le cas français. Ceci nous permet de poser quelques questions qui nous semblent éclairantes sur les ‹ éducations à › et sur la contribution des sciences humaines et sociales à ces éducations. Surtout nous essayons par là même de préciser en quoi les cadres théoriques des didactiques peuvent être (partiellement) spécifiques aux recherches francophones.

2 Tradition scolaire française et éducations à

Depuis la constitution d'un système scolaire puissamment administré (à la fin du 19e siècle), la définition de ce qui doit être enseigné a fait l'objet de très nombreuses tentatives de normalisation. La mise en place d'une « forme scolaire » (Vincent 1994; Monjo 1998) a conduit à faire admettre par tous, à considérer comme nécessaires, un certain nombre de caractéristiques:

- un découpage horizontal du savoir en « matières scolaires » (la grammaire, la géographie, l'algèbre...); ces matières scolaires sont considérées comme d'autant plus dignes qu'elles ont leur homonyme dans la sphère universitaire (Ross 2002); le savoir légitime est donc celui qui peut s'inscrire dans une de ces matières organisées en disciplines scolaires.
- une organisation de la transmission de ces contenus de façon verticale, en fonction de la structuration de l'école en « classes » d'âge, voire de niveau; ceci impose un découpage des matières selon une progressivité d'enseignement qui correspond inégalement à une structuration logique des contenus (thématique, historico-chronologique) ou à une progression d'apprentissage (pour comprendre ceci il faut déjà connaître cela, donc il faut apprendre cela avant ceci).
- contrôle du processus de transmission et de ses résultats par les pratiques d'évaluation, chez les élèves (examens, diplômes), mais aussi dans le corps enseignant (concours, formation des enseignants, inspections).

Pour l'essentiel, cette structure des savoirs scolaires est restée la même depuis le début du 20e siècle et s'est étendue progressivement jusqu'à l'enseignement technique et professionnel. Ceci n'exclut cependant pas l'émergence de quelques ‹ éducations à › souvent fragiles et éphémères introduites dans un souci de progrès social (instruction ménagère, premières formes d'éducation à la santé).

La crise de l'école, résultant pour partie des interrogations sur les contenus adaptés à une massification du public, pour partie de l'évolution de la société et des attentes sociales pour l'école, mais aussi la montée (au moins dans les perceptions) de « problèmes sociaux » tels que la détérioration de l'environnement, l'incivilité et la violence, ont amené dans les années 1990 en France à introduire des « éducations à » (Audigier, Tutiaux-Guillon 2008; Pagoni, Tutiaux-Guillon 2012): « Education à l'environnement – EE », « Education civique, juridique et sociale – ECJS » (Alpe, Legardez 2000), puis « Education au

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développement durable – EDD », qui viennent s'ajouter aux deux qui existaient déjà depuis fort longtemps: l'éducation civique et l'éducation physique et sportive[1], et à celles dont la place reste mouvante et souvent contestée, comme les ‹ éducations à › la santé, à la sécurité, à la sexualité, à l'orientation... Comme les noms l'indiquent, ces « éducations à » ne sont pas des « enseignements de » (Lebeaume 2010) : elles ne possèdent d'ailleurs pas les caractéristiques de ce que l'on appelle les « disciplines scolaires », qui sont toutes définies non seulement par des contenus, mais aussi par des tâches scolaires et des procédures, elles mêmes hiérarchisées. Outre les objets et notions à enseigner, la construction disciplinaire intègre les découpages chronologiques, les méthodes d'enseignement, les pratiques d'évaluation pour construire un « grillage » épistémologique (Muller 2007). Or les ‹ éducations à › ne sont pas actuellement structurées ainsi. Il ne s'agit pas non plus d'éducation au sens générique - d'où l'interrogation sur le statut de ces ‹ éducations à ›, qui ont en commun quatre caractéristiques principales (Alpe, Legardez 2011) :

- elles sont thématiques et interdisciplinaires – voire adisciplinaires, « transversales » (selon la terminologie du ministère de l'éducation nationale français): elles échappent ainsi à la structuration horizontale de la forme scolaire même si elles intègrent des savoirs disciplinaires;
- elles ont une relation étroite avec des questions de société, et interpellent directement les acteurs, parce qu'elles sont d'abord une réponse à une certaine forme de la demande sociale d'éducation; autrement dit, soit en redondance, soit en écart avec les finalités pérennes, elles répondent à des urgences sociales (apparentes ou avérées) conjoncturelles. Elles peuvent alors être porteuses des orientations proposées et des comportements attendus mais aussi des modalités et procédures de prises de décision dans une société démocratique;
- elles accordent une place importante aux valeurs qui constituent une part des prescriptions; en ce sens elles transforment des finalités en objets de travail scolaire, même si elles les partagent avec des disciplines scolaires;
- elles ont comme objectif, généralement explicite, de faire évoluer des comportements, car le but est de comprendre pour agir et d'agir pour se changer soi, changer la société, voire changer le monde. Du coup la structuration verticale par classe d'âge repose plus sur le développement des compétences individuelles que sur la décomposition progressive des savoirs à apprendre.

Ces caractéristiques sont en rupture avec le modèle standard de la forme scolaire en s'appuyant généralement sur des dispositifs didactiques particuliers. Elles posent le problème de la place et de la légitimité des savoirs: scientifiques, académiques, sociaux, scolaires (Legardez, Simonneaux 2006; Alpe 2006) dont elles sont porteuses, c'est-à-dire ici celle des savoirs des sciences sociales et des savoirs sur la société qui circulent hors des mondes académiques et scolaires. Elles posent aussi une autre question beaucoup plus politique, celle de la relation entre les finalités – c'est-à-dire le modèle d'individu et de société qui sous-tend le projet scolaire – et, au-delà des contenus, les formes mêmes dans lesquelles se réalisent l'enseignement et l'apprentissage scolaires. Plus largement elles peuvent offrir l'occasion de réfléchir sur les mutations des systèmes scolaires, qui sont bien entendu des objets sociaux et historiques comme les autres.

[1] Il n'est pas indifférent de noter que ces éducations à ont été pérennisées en référence au redressement politique et social de la France dans les années 1940.

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3 Les sciences sociales dans le système scolaire français: quelles contributions aux éducations à?

Les ‹ éducations à › reposent à nouveaux frais la vieille question de l'articulation de l'éducation et de l'instruction et en particulier ici des connaissances (disciplinaires) nécessaires pour comprendre le monde et la société, interpréter les situations et agir. Ce qui complique les choses est peut-être qu'elles postulent toutes un individu autonome, alors que l'autonomie y oscille entre sa définition de capacité à choisir les connaissances pertinentes et à les utiliser de son propre chef – définition qui maintient un lien fort avec les savoirs disciplinaires – et une autre approche qui met au premier plan l'engagement moral ou intellectuel de l'individu, pour changer le monde et se changer lui-même. Or cette définition-là peut être intégrée dans les disciplines existantes ou non, leur être commune ou non, donc peut imposer un véritable travail de reconstruction pour être articulée sur des pratiques et des apprentissages disciplinairement situés; elle impose aussi une réflexion sur le rapport au monde, aux autres et à soi qui se construit à l'École.

Considérons les disciplines qui dans le système français sont l'avatar scolaire des sciences sociales: histoire, géographie, économie, sociologie, gestion, droit; les deux premières enseignées sous le même nom, les autres en « sciences économiques et sociales » (infra SES), ou en « économie et gestion » (infra EG), ou encore désormais dans les « principes de base d'économie et de gestion » (infra PBEG). Ces disciplines sont évoquées dans des articles de ce numéro (Doussot, Richit).

3.1 Les enseignements économiques

SES, EG et PBEG ne sont enseignées qu'au lycée, c'est à dire dans les trois dernières années du secondaire. L'enseignement de la gestion, encore dénommée « économie d'entreprise » ou parfois de manière un peu abusive « micro-économie », apparaît précocement dans la filière technologique. La forte croissance des filières technologiques (EG) puis professionnelles (filières professionnelles tertiaires) a contribué à son développement significatif, avec un positionnement réciproque entre les deux enseignements (technologique et professionnel) qui a évolué au rythme de nombreuses « rénovations », les plus récentes tentent d'accroître la légitimité scolaire de la filière technologique en la différenciant plus fortement des filières professionnelles et en les rapprochant des disciplines universitaires de référence (économie, management, droit). Les SES sont introduites dans l'enseignement secondaire à la fin des années 1960 avec la création d'une filière d'enseignement général spécifique, dont l'existence a été plusieurs fois remise en cause (Chatel et al. 1990). L'enseignement des SES continue de susciter de nombreux débats avec de multiples rapports d'experts et prises de positions où s'affrontent la place attribuée aux différentes approches économiques, mais aussi les finalités attribuées à cet enseignement (former des citoyens responsables, comprendre les principaux mécanisme de la vie économique, découverte d'une discipline et préparation à une poursuite d'études...) ou bien encore la représentation de l'entreprise qui se construit dans cet enseignement.

On imagine aisément que ces enseignements pourraient contribuer à une éducation à, récemment promue et encore marginale: l'éducation à l'entrepreneuriat (Champy-Remoussenard 2012). Cependant des contenus spécifiques pourraient aussi être sollicités pour l'éducation au développement durable (les relations économie-société-environnement) ou à la santé

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(approches sociologiques). Richit a étudié comment SES et PBEG sont mobilisés dans l'éducation à l'orientation. Enfin la confrontation aux débats de société (au moins en SES) entre dans l'éducation au débat et à la citoyenneté analysée par Panissal et Brossais.

3.2 L'histoire et la géographie

L'histoire et la géographie sont installées au primaire dès le 19e siècle et dans l'ensemble du secondaire depuis 1902 et ont survécu à toutes les réformes. Toutes deux ont des finalités bien ancrées de formation du citoyen et de construction d'une identité commune, à côté des finalités intellectuelles et culturelles, finalités que nul ne conteste, même si le sens des mots a notablement changé depuis le début du 20e siècle. Les contenus prescrits peuvent directement intégrer des thématiques en prise sur l'éducation au développement durable (c'est largement le cas en géographie comme le montre aussi l'article de Doussot) ou sur une éducation à la citoyenneté (en géographie autour du rapport entre citoyen et territoire et en histoire où les questions politiques se taillent la plus grande part des programmes). Le socle commun des connaissances et des compétences (MEN 2006), pour le collège (les quatre premières années du secondaire), définit les buts communs à toutes les disciplines; compétences sociales et civiques, compétences d'autonomie et d'initiative s'apparentent aux prescriptions d'éducations à. Les récents programmes de lycée (MEN 2010 ssq.) prescrivent aussi des capacités que les élèves doivent acquérir dont celles qui s'acquièrent pour et par l'argumentation. Surtout, dans les conceptions qu'en ont les enseignants, histoire et géographie partagent avec les SES le souci fondamental et fondateur d'une éducation critique (cf. LeVasseur et Cardin) revendiquée aussi par les ‹ éducations à › en particulier face à l'abondance d'informations et à l'inégale fiabilité de celles-ci. C'est d'ailleurs l'objet d'une éducation à recommandée en France depuis les années 1970: l'éducation aux médias[2].

Cependant ces disciplines, même si leurs finalités rencontrent les buts des ‹ éducations à ›, ne sont pas structurées pour interpeller les acteurs, rendre explicite les valeurs sous-tendant les projets sociaux ou faire évoluer directement les comportements. Elles peuvent porter à la connaissance des élèves des informations qu'ils ne pourraient pas connaître autrement, et qui ont leur pertinence pour les ‹ éducations à ›, mais elles demeurent organisées par des thématiques disciplinaires que les enseignants réfèrent plus souvent aux savoirs universitaires qu'aux problèmes de société.

Cependant ces disciplines, même si leurs finalités rencontrent les buts des ‹

[2] Le CLEMI (Centre de Liaison de l'Enseignement et des Moyens d'Information) est chargé de l'éducation aux médias dans le système éducatif français depuis 1983. Il a pour mission d'apprendre aux élèves une pratique citoyenne des médias, grâce à des partenariats entre enseignants et professionnels de l'information. Cette éducation implique désormais une éducation à l'usage du web. Elle a fait l'objet d'un encadrement plus net depuis 2007: "Pour que l'éducation aux médias puisse ne plus être considérée comme une affaire de militants ou d'amateurs, il paraît nécessaire de passer au stade d'une démarche globale, construite et pilotée. L'enjeu est tel pour le fonctionnement de notre démocratie comme pour les apprentissages fondamentaux (maîtrise des langages, culture générale, esprit critique, autonomie, citoyenneté) – qui ne peuvent pas faire l'économie d'une formation minimale à l'usage des médias modernes – que le système scolaire a le devoir de mettre en place les conditions d'une meilleure intégration de ces objectifs aux enseignements existants." écrit l'inspection générale de l'éducation nationale. Source : eduscol.education.fr/.../education-aux-medias/.../recommandations-fr

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éducations à ›, ne sont pas structurées pour interpeller les acteurs, rendre explicite les valeurs sous-tendant les projets sociaux ou faire évoluer directement les comportements. Elles peuvent porter à la connaissance des élèves des informations qu'ils ne pourraient pas connaître autrement, et qui ont leur pertinence pour les ‹ éducations à ›, mais elles demeurent organisées par des thématiques *disciplinaires* que les enseignants réfèrent plus souvent aux savoirs universitaires qu'aux problèmes de société.

4 Les apports des didactiques

4.1 - Didactiques des disciplines, disciplines scolaires et éducations à…

De la même manière que l'enseignement s'est structuré autour des disciplines, les recherches didactiques se sont organisées selon un découpage disciplinaire: en effet – et même si les références théoriques mobilisées peuvent appartenir à d'autres champs scientifiques – ce qui spécifie les didactiques au sein des sciences de l'éducation est la centration sur les contenus (prescrits, enseignés, appris). Nombre de didacticiens sont issus initialement d'une formation dans la discipline scientifique homonyme à la discipline scolaire. Les didactiques se différencient entre elles en référence aux disciplines, et surtout la didactique s'est différenciée de la pédagogie par son attention aux entrées disciplinaires, voire n'est légitimée que dans une forme de « vénération de la discipline » (Chevallard 2006). Comme on le voit dans les articles de ce numéro, ceci oriente le questionnement relatif aux ‹ éducations à › dans deux directions conjointes: les particularités des ‹ éducations à › relativement aux enseignements disciplinaires (Barthes, Jeziorski), et les relations entre ‹ éducations à › et disciplines installées (Doussot; Panissal, Brossais; Richit). Ceci signifie aussi que ce sont les instruments théoriques des didactiques qui sont mobilisés pour interroger les ‹ éducations à ›: didactique s'entend ici comme étude méthodique et outillée visant à produire des connaissances valides sur ce qui est prescrit, s'enseigne et s'apprend dans une discipline spécifique. Proposer de bonnes pratiques peut être un but de ces recherches mais ce n'est ni le seul ni toujours le principal, même si la plupart de ces recherches ont aussi comme objectif d'éclairer les réflexions voire les pratiques des enseignants.

Les didactiques se sont développées depuis maintenant une bonne trentaine d'années; elles ont donné lieu à circulation des modèles et des concepts, à des emprunts croisés, voire à des rapprochements entre didactiques des sciences sociales[3] ou entre didactique des sciences et des technologies (Hasni, Lebeaume 2010). Les années 2000 voient l'émergence d'une didactique comparée : la comparaison de ne porte plus seulement sur la circulation de concepts d'une didactique disciplinaire à une autre, mais consiste à distinguer le caractère spécifique du caractère générique au sein des phénomènes didactiques et à opérer la « mise à jour de points aveugles respectifs » dans les différentes didactiques disciplinaires (Mercier et al. 2002). Même si pour le moment peu de travaux de didactique comparée ont pour objet les ‹ éducations à ›, il n'en demeure pas moins que cette analyse peut se révéler pertinente pour des objets situés dans une transversalité aux disciplines, et auxquelles le ministère impose

[3] Ceci se manifestait par exemple dans les colloques de didactiques qui ont eu lieu à l'INRP entre 1986 et 1996 (et qui ont donné lieu à publication) ou plus récemment dans le développement d'une nouvelle association dévolue à la recherche en didactique de l'histoire et des sciences sociales (www.irahsse.org)

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à toutes les disciplines de participer. D'ailleurs à défaut de comparaison entre didactiques, des projets récents sur les ‹ éducations à › associent plusieurs didactiques comme c'est le cas pour la recherche menée sur « l'éducation au développement durable; appuis et obstacles[4] » à laquelle collaborent les auteurs de ce texte. Cette recherche croise plusieurs perspectives didactiques disciplinaires (histoire, géographie, économie, sciences de la vie et de la terre, chimie, zootechnie, agronomie...) et pose des questions de didactiques « régionales »: didactiques des questions « scientifiques » socialement vives et didactiques des questions « sociales » socialement vives, qui convergent pour analyser l'objet d'étude EDD.

Cette recherche s'inscrit dans une didactique que nous pouvons qualifier de critique. Le développement d'un courant didactique critique dans le champ didactique francophone à partir de la fin des années 1990, parfois rattaché à une didactique comparée, semble plus immédiatement pertinent pour les questions de recherche sur les éducations. Ce courant critique contribue à dépasser une structuration disciplinaire de la didactique mais surtout réoriente les recherches à partir du concept de Questions Socialement Vives (Legardez, Simonneaux 2006; Simonneaux, Legardez 2011). D'autres travaux relevant de cette didactique critique peuvent être signalés: les recherches autour de l'Education relative à l'Environnement (Bader, Girault, Sauvé) mais aussi le courant international des Socio-Scientific Issues (SSI) en didactique des Sciences. Dans ce cas, il est admis que raisonnement doit prendre en compte la complexité de la question, un nécessaire examen sous plusieurs angles sur un questionnement en cours qui doit faire preuve de scepticisme face au manque d'information (Sadler et al. 2007).

Il est frappant de voir les convergences entre les objets de cette didactique critique, qui tous cristallisent des enjeux de valeurs et de choix politiques, avec certaines ‹ éducations à › (ERE bien sûr, mais aussi EDD et éducations aux médias, au débat, à la citoyenneté). Avec les questions socialement vives, les recherches sur l'enseignement-apprentissage s'élargissent à un questionnement sur les finalités et la validité des contenus disciplinaires et des activités scolaires. A la croisée de ces différentes entrées, se trouvent les problématiques des valeurs, de l'expertise, de la médiatisation et des cultures.

Les recherches didactiques ont explicitement exploré les dimensions épistémologiques, axiologiques et sociales des enseignements et des apprentissages disciplinaires et plus récemment celles des ‹ éducations à ›. Dans cette perspective, ces recherches peuvent privilégier ou croiser plusieurs dimensions:

- les dimensions socio-épistémologiques des savoirs scolaires ainsi que des savoirs et pratiques de références : construction et paradigmes des disciplines scolaires, étude des domaines de validité, des modalités d'élaboration des savoirs, des enjeux des acteurs autour de ces savoirs, du rôle des modèles, des incertitudes et controverses sur ces références;
- les dimensions psycho-sociales du processus d'enseignement-apprentissage sont étudiées au travers des représentations, des raisonnements, des prises de décision et plus globalement des engagements des acteurs.
- Les dimensions opérationnelles avec l'analyse des dispositifs éducatifs: débats, environnement numériques, travaux personnels, projets participatifs,

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interactions entre pairs.

Les contributions à ce numéro, spécifiques des ‹ éducations à › dans leur questionnement, recouvrent ces trois dimensions et se centrent sur la construction des savoirs et des références, la prise en compte des représentations sociales, la place des valeurs et enfin les postures enseignantes entre neutralité et engagement.

4.2 La construction des savoirs et des références

Les modalités d'élaboration des savoirs scolaires ont principalement été envisagées selon deux modèles. D'abord le modèle de la transposition didactique, théorisée par Yves Chevallard (1985) d'après les travaux du sociologue Michel Verret, a largement essaimé hors de la didactique des mathématiques. La transposition didactique interprète la transformation des savoirs qui permet leur scolarisation en privilégiant d'une part la référence aux savoirs scientifiques établis et d'autre part le profond changement de nature qui les affecte lorsqu'ils sont prescrits et enseignés. Ce modèle a été étendu en posant aussi l'épistémologie comme savoir scientifique de référence (en particulier en didactique de la géographie) et parfois en dénonçant la déformation subie par les savoirs de référence. Ce modèle conserve sa pertinence pour analyser certains des savoirs relatifs aux ‹ éducations à ›, en particulier en permettant de penser comment ces savoirs sont sortis de leurs contextes scientifiques d'origine pour être recontextualisés pour l'école et comment ceci se fait au prix de l'effacement de leurs auteurs et des débats scientifiques qui les accompagnent.

L'autre modèle utilisé en didactique des sciences sociales est celui de la « discipline scolaire » proposé par Chervel (1988/1995). Selon lui les disciplines scolaires sont organisées par une vulgate (ce que chacun s'accorde à voir enseigné et appris à l'École), des exercices usuels permettant au cours de se faire, des évaluations et des pratiques de motivations stabilisées dans le temps, le tout centré sur des finalités. Ces finalités, et la structuration qui en résulte, permettent la pérennisation de la discipline scolaire, laquelle répond fondamentalement à un projet social. La spécificité de ce modèle – outre le fait qu'il inclut les pratiques – est de proposer d'autres références pour les savoirs scolaires, en posant que ces derniers peuvent être des constructions sociales, sans référents scientifiques constitués, visant avant tout à répondre à des problèmes scolaires (ce que montre Chervel en particulier pour la grammaire au 19e siècle). Prendre appui sur ces travaux pour des recherches sur les ‹ éducations à › permet d'une part de clarifier certaines de leurs différences avec les enseignements et d'autre part de penser leurs contenus comme des créations scolaires qui peuvent intégrer des savoirs sociaux différents des seuls savoirs issus des sciences. Une telle lecture situe les valeurs et les comportements comme des contenus d'enseignement et d'apprentissage légitimes même quand les références scientifiques leur font défaut.

Les contributions à ce numéro relèvent d'une diversité de posture face à la construction disciplinaire. Les problématiques posées par Doussot, LeVasseur et Cardin ou bien encore par Richit s'inscrivent dans une identification, voire dans un renforcement, des structures disciplinaires existantes. A l'opposé, l'éducation aux nanotechnologies proposée par Panissal et Brossais s'appuie sur des savoirs interdisciplinaires et oblige à dépasser les découpages habituels. Ce dernier choix rend plus malaisé de prendre appui sur les modèles constitués pour caractériser les disciplines, ce qui peut expliquer que les choix théoriques de ces

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auteurs s'ancrent dans la psychologie et la linguistique.

L'interrogation épistémologique peut aussi se porter en-deçà de la sphère scolaire, en particulier lorsque les savoirs scolaires ne peuvent se référer à des savoirs déjà institutionnalisés. Ainsi il peut s'agir d'analyser les modes de construction des savoirs et des pratiques de référence lorsque ceux-ci sont incertains et non stabilisés comme c'est le cas pour nombre d'éducations à. Ces ‹ éducations à › soulèvent des questions porteuses d'incertitudes qui dépassent la sphère de l'expertise scientifique et qui suscitent des débats dans la société, notamment dans les médias. Il appert alors que ce sont les finalités qui, pour les enseignants deviennent la référence, sans doute d'autant plus aisément que la formation de l'esprit critique est une tradition scolaire fortement présente dans les disciplines apparentées aux sciences sociales. Face aux références controversées, les finalités éducatives revendiquées par les enseignants s'inscrivent dans une perspective critique. Il en est ainsi de questions environnementales, de questions économiques ou sociales dans l'éducation à l'environnement ou au développement durable (Simonneaux, Simonneaux 2009) et plus globalement des questions socialement vives. L'article de Panissal et Brossais sur l'éducation aux nanotechnologies intègre explicitement ces incertitudes pour contribuer ainsi à une éducation aux risques. Les textes de Barthes et Jeziorski, de LeVasseur et Cardin ainsi que de Doussot affirment aussi la place centrale de l'éducation critique.

4.3 Les représentations sociales comme outils d'analyse en didactique

Les recherches qui visent à rendre compte de l'enseignement et surtout de l'apprentissage sont étayées le plus souvent de modèles issus de la psychologie, et pour ce qui concerne les didactiques des sciences sociales, de la psychologie sociale. Le champ de la didactique des sciences expérimentales s'est développé autour de l'analyse des conceptions et connaissances (Giordan, Girault, Clément 1994), celui de l'histoire (en particulier: Lautier 1997) ou de l'économie autour du concept de représentations sociales emprunté à Moscovici (1976), Jodelet (1989) ou Abric (1994). Alain Legardez (2001, 2004) a réinterprété ce concept en didactique des SES dans celui de système de représentations-connaissances. Les représentations sociales intéressent les didacticiens en ce qu'elles nomment et caractérisent un produit et un processus d'apprentissage qui associe des connaissances (tenues pour vraies et fiables, quelle que soit leur validité pour l'expert), des valeurs, des connotations affectives, des attitudes et des jugements. Ajoutons que les chercheurs en font un des ressorts de la communication, de l'action et des identités partagées. En ce sens, mobiliser ce concept a permis d'interpréter des acquis, des obstacles et des appuis aux apprentissages et s'avère particulièrement fructueux pour les ‹ éducations à › dans la mesure où justement elles intègrent explicitement des dimensions éthiques et psycho-affectives, en même temps qu'elles visent des actions et des engagements. L'article de Barthes et Jeziorski propose l'exemple de cette construction sociale en montrant l'impact du contexte socio-culturel et politique sur les représentations du développement durable puisque les représentations des étudiants polonais se différencient très significativement des représentations d'étudiants allemands ou français. LeVasseur et Cardin s'interrogent, pour leur part, sur la tension entre la construction d'une norme historique collective et les différentes représentations de l'histoire que peuvent se construire les étudiants face à une société et une culture en changement.

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4.4 Quelles interrogations sur les valeurs?

Dans les didactiques des « sciences », - les premières à avoir été développées -, et pour beaucoup des recherches fondatrices, les références de savoir sont considérées comme stables et valides, toute augmentation d'informations ou acquisition de connaissances[5] par les apprenants est supposée favoriser une conduite rationnelle et un esprit critique. L'instruction, dans une approche finalement très positiviste, est le garant de l'éducation. C'est aussi ce postulat qui sous-tend l'énoncé des finalités des disciplines scolaires depuis la fin du 19e siècle: acquérir des connaissances fondées en sciences (ou réputées telles) permet d'accéder à une pensée rationnelle et partant à des comportements sociaux et civiques raisonnés, ainsi qu'à une réflexion qui bannit les préjugés et les croyances obsolètes. Connaître la science nourrirait ainsi les valeurs démocratiques. Le modèle éducatif peut-être qualifié de « deficit model », il suffit de combler le manque d'informations pour prendre les bonnes décisions.

Dans ce contexte, il n'y a pas de temps scolaire spécifiquement dévolu aux « valeurs », en dehors de l'instruction civique[VI6] et pour partie de la philosophie (qui n'est enseignée qu'en dernière année du secondaire en France); elles sont intégrées aux disciplines. Il est admis que l'enseignement dans son ensemble contribue à diffuser un modèle (citoyenneté, responsabilité, solidarité, etc.) explicité dans les programmes en tant que finalités disciplinaires. Ces fonctions socio-politiques de l'école (Prost 1992), revendiquées comme telles par les pères de l'école publique, et analysées dès le début du 20e siècle par Durkheim (1922/1968), justifiaient dans les enseignements la présence de valeurs, ou même de positions idéologiques, peu mises en question jusqu'aux années soixante. Les enseignants d'histoire-géographie français (pour prendre un exemple qui fait écho à l'article de LeVasseur et Cardin) font de la formation du citoyen le but normal de leur enseignement, et en conçoivent les effets comme une sorte de neutralité républicaine qui n'affecte pas l'objectivité scientifique (Lautier 1997). Par ailleurs, le débat sur la place des valeurs au sein des sciences économiques est ancien mais reste vif et controversé tant dans les savoirs de référence que dans les savoirs scolaires. Au-delà de précurseurs comme Hirschman (1984) ou Sen (1999), les prises de position récentes sont nombreuses pour défendre une économie qui intègre ou articule des valeurs et des principes humains ou politiques.

La place explicite des valeurs a connu dans la seconde moitié du 20e siècle un rétrécissement progressif au cours du lent processus de didactisation des contenus scolaires: la nécessité d'enseigner à des élèves nombreux et hétérogènes issus de la massification scolaire (Merle 2009) donne la priorité aux contenus de savoir, la méfiance résultant de la mise en cause idéologique des fonctions de l'école (inégalité des chances scolaires, rôle du capital culturel) par la sociologie de l'éducation (Bourdieu, Passeron 1970), les critiques virulentes contre une visée nationaliste, potentiellement exclusive de l'altérité et des identités vécues (Citron 1989), conduisent à suspecter l'école de mystification

[5] Nous utilisons en français deux termes différents pour traduire knowledge: « savoir » rend compte d'un ensemble de concepts et notions élaborés par une communauté (scientifique, professionnelle...) et « connaissance » qui fait référence aux apprentissages d'un individu-sujet sur un thème.

[6] Cette instruction – sous différentes dénominations – est d'abord limitée au primaire, puis après la seconde guerre mondiale étendue au secondaire de base; c'est seulement depuis 2000 qu'elle est présente dans tout le secondaire et toutes les filières. Ajoutons qu'elle est fréquemment au primaire et au collège peu enseignées effectivement (Audigier, Tutiaux-Guillon 2004; Audigier, 2010).

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pédagogique (Charlot 1976), d'endoctrinement (Reboul 1977) ou de transmettre de fait un « curriculum caché » (Perrenoud 1993). Les valeurs deviennent en quelque sorte les « passagers clandestins » des savoirs, qu'il conviendrait d'expulser (Solonel, Tutiaux-Guillon 1999). Les didactiques ne prennent alors que rarement les valeurs comme objet de recherche, leur préférant des contenus d'enseignement et d'apprentissage plus légitimes.

C'est ici que la question des ‹ éducations à › change notablement la donne. En effet, comme nous l'avons indiqué plus haut, elles sont prescrites pour répondre à des enjeux sociaux et politiques mettant ouvertement en jeu des valeurs, et les textes qui les définissent font une part très claire à ces dernières (même s'ils esquivent le débat sur leur signification et leur pertinence). Analyser les ‹ éducations à ›, y compris dans une perspective didactique, nécessite ainsi de se confronter aux valeurs comme contenus d'enseignement.

L'enjeu n'est pas qu'éducatif, il est aussi un enjeu démocratique, il s'agit de faire passer l'éducation et les recherches en didactique du cadre théorique du « deficit model » soit à un modèle délibératif, soit à un modèle « education as praxis », voire à un modèle dissident et conflictuel (Levinson 2011). Dans le déficit model, la relation didactique est hiérarchique et l'apprentissage de savoirs permet le développement des compétences. Dans le modèle délibératif, le dialogue est ouvert avec la participation des différents acteurs face à des savoirs incertains ou faillibles, voire des savoirs contextualisés, distribués et émergents entre différents acteurs dans le modèle pratique.

Ceci peut rejoindre un autre questionnement sur la place faite dans les prescriptions et les pratiques, disciplinaires ou non, aux projets politiques / idéologiques sous-tendant les ‹ éducations à ›... Ceux-ci peuvent être explicites: le modèle de citoyen ou le modèle de personne peuvent être précisés dans les finalités affichées dans les textes. Souvent les ‹ éducations à › visent l'engagement, la responsabilité, l'apprentissage du débat et la maîtrise de l'information dans une société où elle est surabondante et contradictoire. Pourtant le type de société ou de fonctionnement politique le sont plus rarement. Par exemple, on peut déceler un glissement entre le citoyen et l'acteur économique (producteur et consommateur), c'est-à-dire aussi un effacement du politique. On peut encore questionner la centration sur l'individu faite, dans diverses ‹ éducations à ›, aux dépens d'une réflexion sur ce qui est socialement construit et déterminé et sur la responsabilité du politique, là encore. Il est tentant de voir dans ces prescriptions une valorisation (implicite) du libéralisme politique, économique sur une base de philosophie libérale alors qu'un objectif pourrait être de contribuer à co-construire une nouvelle citoyenneté critique. Ici se rencontrent de nouvelles orientations des didactiques. La manière dont le politique interfère avec l'enjeu éducatif est explicitement abordée dans ce numéro dans les contributions de Barthes et Jeziorsky ou de LeVasseur et Cardin, la dimension politique est au cœur de la problématique de Doussot qui analyse les relations entre savoirs géographiques et compétences politiques.

5 De la neutralité à l'engagement, analyser les postures des acteurs dans les éducations à

Face à une injonction institutionnelle explicite en matière éducative, de nombreuses recherches ont montré une réserve des enseignants à s'engager préférant une neutralité déclarée (Simonneaux, Simonneaux 2006). Plus peut-être que dans d'autres enseignements, avec les ‹ éducations à › les enseignants sont directement interpellés comme personnes et comme citoyens, confrontés à

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leurs valeurs en même temps qu'à celles qui sont prescrites ou sous-jacentes aux prescriptions. Ils ne peuvent plus se réfugier derrière un enseignement seulement factuel; beaucoup en sont mal à l'aise. En outre les ‹ éducations à › ouvrent plus largement l'École à d'autres intervenants et plus particulièrement aux militants de certaines associations. Comment chacun peut-il alors trouver sa place? Certains enseignants ont appris la leçon de la sociologie et hésitent à se reconnaître « neutres », mais ils aspirent à une objectivité qui fait partie de leur déontologie professionnelle. Nombreux sont ceux qui se considèrent strictement comme des « professeurs », et non des éducateurs. Toutefois, dans certains contextes difficiles, des enseignants font passer l'éducation au vivre ensemble comme leur priorité (Lautier 2002). Le tableau n'est donc pas homogène et consensuel. Et la question de leur positionnement est pour eux très vive, surtout lorsqu'il s'agit de transmettre des valeurs ou d'encourager des comportements. Or cette question rejoint précisément celle qui se pose aux chercheurs travaillant sur l'enseignement des questions socialement vives (Simonneaux 2006).

Laurence Simonneaux s'appuie en particulier sur les travaux de Kelly (1986) qui envisage quatre postures: la neutralité exclusive, la partialité exclusive, l'impartialité neutre et l'impartialité engagée. Les partisans de la neutralité exclusive considèrent que les enseignants ne doivent pas aborder des thèmes controversés et que les découvertes scientifiques sont des vérités exemptes de valeurs. Ils s'inscrivent dans le positivisme. La partialité exclusive est caractérisée par l'intention délibérée de conduire les élèves à adopter un point de vue particulier. Dans ce cas, les positions contradictoires sont ignorées par les enseignants ou plus ou moins insidieusement minorées. Pour eux, on doit fournir aux élèves une certitude intellectuelle – laquelle pourrait bien frôler l'endoctrinement. Cette posture est cependant admise lorsqu'il s'agit d'éducation à la santé qui définit explicitement les bonnes pratiques. Les partisans de l'impartialité neutre pensent que les élèves doivent être impliqués dans des débats sur des questions controversées dans le cadre de l'éducation à la citoyenneté et que les enseignants doivent se garder de dévoiler leurs points de vue. Pour certains partisans de cette position, cette posture préserverait leur autorité en ne montrant pas leur indécision ou leur ignorance, pour d'autres, il convient surtout de ne pas influencer l'argumentation des élèves, même par une confrontation à la réflexion d'un adulte expert. Dans la position d'impartialité engagée, position apparemment paradoxale, les enseignants donnent leurs points de vue tout en favorisant l'analyse de points de vue en compétition sur les controverses. Il s'agit de la posture préférée par Kelly car, - mis en présence des idées des enseignants, encouragés à évaluer la validité de ces idées dans un climat exempt de sanctions potentielles -, les élèves développent des compétences d'engagement civique et de courage. Selon Kelly, l'équilibre entre l'engagement personnel et l'impartialité permet de catalyser l'intelligence critique et le courage civique des élèves et des enseignants; les élèves se sentent plus adultes.

Les arguments développés par Kelly, tant dans ses critiques des postures qu'il présente que dans la valorisation de l'impartialité engagée rejoignent clairement les visées des ‹ éducations à ›. Et la grille de lecture qu'il a construite pourrait permettre une interprétation des positionnements des enseignants face aux ‹ éducations à ›, dans la mesure où celles-ci, même hors de toute controverse, sollicitent directement l'enseignant comme acteur de l'éducation, de la société et du politique et le conduisent, s'il prend en charge cet enseignement, à s'engager.

L'analyse des enjeux éducatifs des *socio-scientific issues* que fait Laurence Simonneaux (2011) est éclairante pour analyser ce qui est attendu, non pas seulement du point de vue des enseignants, mais du côté des apprenants dans le

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domaine des ‹ éducations à ›. Les enjeux constituent un continuum entre, d'un côté, une promotion des savoirs considérés comme stables, considérant alors qu'une information fiable est suffisante, et à l'autre extrémité, la promotion d'un engagement militant, et c'est alors une éducation citoyenne et politique qui est revendiquée. Entre ces deux pôles, on trouvera des enjeux éducatifs de niveau complexe (analyse des controverses et incertitudes, des risques, des valeurs) voire de pensée critique dans les prises de décision. Les enjeux présentés dans les analyses conduites dans ce numéro s'inscrivent majoritairement dans une pensée critique sans cependant franchir la frontière vers l'activisme militant.

Conclusion

La diversité des cadres d'analyse montre la fécondité des recherches didactiques francophones dans le domaine des ‹ éducations à ›. Les travaux présentés dans ce numéro nous semblent s'inscrire dans la perspective critique qui est celle des recherches récentes en didactique francophone. Ces recherches montrent cependant les difficultés pour inscrire les pratiques éducatives dans cette perspective critique tant du point de vue institutionnel que du point de vue des acteurs du système éducatif notamment des enseignants.

De telles recherches sont-elles spécifiques à la francophonie? Il nous apparaît que ce courant critique trouve des convergences et des échos au niveau international dans le champ des sciences de l'éducation (Benzce et al. 2009; Kelly 1986; Levinson 2010; Sadler et al. 2007) ou de la philosophie politique. C'est une question philosophique et politique car les ‹ éducations à › mettent au cœur de la problématique les conceptions qu'ont les apprenants des êtres humains et d'eux-mêmes, les conceptions de la société, du monde et de la nature ou plus exactement des relations entre l'humanité, la société, le monde et la nature (Bader, Sauvé 2011). Ces différentes conceptions mettent en tension le processus d'autonomie des individus avec le processus d'acculturation, en revendiquant l'un sans vouloir exclure l'autre. De plus, s'ajoute une tension entre le présent et l'avenir puisque les ‹ éducations à › incitent, voire nécessitent, une projection dans l'avenir de soi-même, de la société, de la nature - projection qui nécessairement affecte aussi le rapport au passé (Koselleck 1990; Angvik, Von Borries 1997). Au moment où la société, de plus en plus individualiste, se trouve confrontée à des crises multiples (environnementales, économiques, politiques), il nous paraît logique et important que ces tensions fassent leur entrée dans l'école.

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Editorial: Educations For ... and Social Sciences, Research and Perspectives in the French-Speaking World

1 Introduction

From the late 19th century on, certain 'educations for' were able to be introduced into teaching either into existing subjects (e.g. education for health and hygiene became part of both the sciences and domestic science) or parallel to them (alcohol education) (Freyssinet-Dominjon, Nourrisson 2009, Lebeaume 2010; Nourrisson, Parayre 2012). At the same time, varying forms of education for citizenship were included in a number of school systems. But, since the late 20th century, integrating 'educations for' seems to have become topical again affecting, to a greater or lesser extent, all cultures. The denominations and forms are varied (education for health, human rights education, education for peace, education for sustainable development, education in responsibility, entrepreneurship education, and education for citizenship). 'Educations for' can be cross disciplinary, trans-disciplinary or sometimes a-disciplinary or they may be linked to different disciplinary fields within a discipline based system either inside the disciplines already established or as a complementary subject. The humanities and social sciences are concerned in two ways: in terms of teaching, they can be used as a reference for the school disciplines related to them (history, geopolitics, sociology, economics...), and in terms of educational research, they can call into question and clarify these changes (sociology of education, philosophy of education, didactics...).

In this issue, we offer a reflection on 'educations for' regarding them as something we can deconstruct, make sense of from different perspectives and even help construct as an educational field. Thus, education for peace can be considered from a geopolitical point of view (does it have the same aims and the same content in a state where war is a distant memory or in a state where recent conflict is still in everyone's mind?), from the viewpoint of history (in which historical contexts is this type of education introduce? Are there any traces of it for example between the two world wars?), from the point of view of didactics (which curriculum? what is to be learned? which situations are conducive to learning what is to be learned? what barriers do teachers and learners encounter? how can we assess its effectiveness - the risk of war, the litmus test of a successful outcome for this type of education, cannot be programmed and is not desired?). In this issue it is the didactic perspective that dominates. Doussot examines how geography contributes to educating for ecologically responsible citizens and Richit looks at how the social sciences help pupils to make career choices. The article by Barthes and Jeziorski underlines the risks of fragmenting teaching content and the absence of a systemic approach to education for, at university level.

Panissal and Brossais demonstrate the effective role of debate in developing scientific citizenship. The humanities and social sciences also evoke the central question of such 'education for' projects: which human being, social actor, person, citizen do we want to forge? This is also the underlying question in several articles, for example concerning the question of developing critical thinking (Barthes, Jeziorski; Cardin, LeVasseur; Doussot) or more generally a citizen spirit (Cardin, LeVasseur; Panissal, Brossais). Although most of the articles take account of the 'educations for' which are prescribed and put into

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practice, the focus on the disciplines does not preclude a reflection on inclusive educational projects: by challenging the social frameworks of history teaching and its legitimacy, LeVasseur and Cardin present it as an education for living in society which goes beyond the initial framework of the academic discipline.

This introduction is based on the French situation but, the articles in this issue are by no means limited to France. This focus allows us to ask, what we consider to be, some enlightening questions on 'educations for' and on the contribution of the humanities and social sciences to these educations. More importantly, we also try to explain in what way the theoretical frameworks of didactics may be (partially) specific to research carried out in the French-speaking world.

2 French School Tradition and Educations For ...

Since the creation of a closely administered school system (in the late 19th century), many attempts have been made to standardize what should be taught. The result of setting up a "model for school" (Vincent 1994; Monjo 1998) is that everyone accepts or considers that certain characteristics are necessary:

- A horizontal division of knowledge into "school subjects" (grammar, geography, algebra...); these school subjects are considered to be all the more noble because they have homonyms in the university sphere (Ross 2002); it follows that legitimate knowledge is knowledge which can become an integral part of one of these subjects, organized into school disciplines.
- A vertical transmission of content based on the way school is divided into "classes" according to age group or level; this implies the division of the subjects according to pedagogical progression corresponding to a greater or lesser extent to a logical content structure (thematic, chronological-historical) or to a progression in what is learned (in order to understand this you have to know that which means that must be learned before this).
- A method of controlling the process of transmission and its results by evaluating the pupils (exams, qualifications), but also the teachers (competitive exams, teacher training, inspections).

The structure of academic knowledge has remained the same, in essence, since the early 20th century and has gradually spread to the technical and vocational sphere. This fact has not, however, precluded the emergence of several, often fragile and short-lived, 'educations for' introduced for the sake of social progress (domestic science, early forms of education for health).

In France in the 1990s, the education crisis, which stemmed partly from doubts about learning content adapted to the massification of secondary education, partly from the changes in society and social expectations for school, but also from the increase (at least in people's perceptions) in "social problems" such as a deterioration of the environment, antisocial behavior and violence, led to the introduction of "educations for" (Audigier, Tutiaux-Guillon 2008; Pagoni, Tutiaux-Guillon 2012): Education à l'environnement – EE" *(environmental education)*, "Education civique, juridique et sociale – ECJS" *(civics, law and social education)* (Alpe, Legardez 2000), then "Education au développement durable – EDD" *(education for sustainable development)*. These were added to civics education and physical and sports education[1], both of which had already existed for many years, and to those whose status remains uncertain and often disputed

[1] It is interesting to note that these 'educations for' were maintained in reference to France's political and social recovery in the 1940s.

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like educating for: health, safety, sex, career choices... As their denominations indicate, these 'educations for' are not "teachings of" (Lebeaume 2010): they do not have the characteristics of what we call "school disciplines" which are all defined, not only in terms of their content, but also in terms of prioritized school tasks and procedures.

In addition to the objects and notions to be taught, discipline construction incorporates the chronological divisions, teaching methods and evaluation practices to build an epistemic framework (Muller 2007). Yet, at the present time 'educations for' are not structured in this way. It is not a question either of education in a generic sense – hence the debate over the status of these 'educations for' which have four main characteristics in common (Alpe, Legardez 2011):

- they are thematic and interdisciplinary – even a-disciplinary, "cross disciplinary" (according to French Ministry of Education terminology): they thus escape the horizontal structuring of the school model even though they may include some subject-specific knowledge;
- they are closely linked to social issues and engage the actors directly because they are primarily a response to some form of social demand for education; in other words, whether they are the same as or different to long standing goals, they respond to urgent (apparent or recognized) cyclical social concerns. They may therefore be a vector for the orientations proposed and the behavior and attitudes expected but also for the modalities and procedures for decision-making in a democratic society;
- they attach importance to values which form part of the prescriptions; in this sense they transform goals into objects for school work, even if they share these aims with school disciplines;
- they target, generally explicitly, a change in attitude and behavior because the objective is to understand in order to act and to act in order to change oneself, change society, and even to change the world. And the vertical disciplinary structure by age group is based more on the development of individual skills than on the progressive fractionating of what is to be learned.

These characteristics break away from the standard school model by referring to specific didactic systems. They raise the issue of the status and legitimacy of the scientific, academic, social, school knowledge (Legardez, Simonneaux 2006; Alpe 2006) they convey, which means here, the knowledge of social sciences and knowledge about society circulating outside school and the academic world. They also raise another much more political question about the link between the aims – that is to say the model of the individual and of society underlying the school project – and over and above the content, the very ways in which teaching and learning is actually carried out in school. More generally, they may give us the opportunity to reflect on the mutations of the school systems which are of course mere social and historical objects.

3 The Social Sciences Within the French School System: What do they Contribute to Educations For?

'Educations for' again raise the old question of the articulation of education and training and, in particular here, the (subject-specific) knowledge required to understand the world and society, to interpret the situations and to act. What complicates matters is that the postulate remains an autonomous individual yet autonomy oscillates between its definition as the ability to choose the appropriate knowledge and to use it on one's own initiative - a definition which maintains a strong link with subject-specific knowledge – and an alternative

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approach which focuses on the individual's moral or intellectual commitment to changing the world and to changing himself. However, this particular definition may or may not be incorporated into existing disciplines, may or may not be common to them, therefore may impose work on a genuine reconstruction in order to correlate with the situated, discipline-specific practices and learning; it also imposes a reflection on the how the relationship to the world, to others and to oneself, is developed at school.

Let's consider the following disciplines: history, geography, economics, management and law which, in the French system, are school avatars of the social sciences. The first two are taught as one combined subject, the others as "sciences économiques et sociales – SES" *(economics and social sciences)*, or "économie et gestion – EG" *(economics and management)* or even "principes de base d'économie et de gestion – PBEG" *(basic principles of economics and management)*. These disciplines are referred to in some of the articles included in this issue (Doussot, Richit).

3.1 The Economics Programs

SES, EG and PBEG are only taught in *lycée,* that is to say during the last three years of secondary education. The teaching of management, still called "business economics" or sometimes somewhat inappropriately "micro-economics", appears early on in the technological study stream. The significant increase in the number of classes, first in the technological (EG) then in the (tertiary) vocational streams, has contributed to its development with a tacit agreement being reached over the different positioning of these two programs (vocational and technological). This has gradually evolved thanks to a whole string of "renovations" the most recent of which endeavor to increase the academic legitimacy of the technological stream by differentiating it more clearly from the vocational stream and by bringing it closer to the disciplines of reference in higher education (economics, management, law). In the late 1960s, the SES option was introduced into secondary education creating a specific stream in general education, the existence of which has been challenged on several occasions (Chatel et al. 1990). The SES program continues to spark debate with various expert reports and opinions clashing over the different economic approaches but also the goals attributed to this discipline (to produce responsible citizens, to provide insight into the principle mechanisms of economic life, to discover a discipline and prepare for further studies...) or even the image it conveys of the corporate world.

We can easily imagine that these programs could contribute to an education for created recently and still marginal: entrepreneurship education (Champy-Remoussenard 2012). However, specific parts of the teaching content could also be used in an education for sustainable development (the links between economics-society-environment) or health education (sociological approaches). Richit has examined how SES and PBEG are mobilized in educating for career guidance. Finally, the confrontation with debates going on in society (at least in SES) comes into the realm of education in debating and citizenship analyzed by Panissal and Brossais

3.2 History and Geography

History and geography have been present in primary education since the 19th century, part of secondary education since 1902 and have survived all the

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reforms. Parallel to the intellectual and cultural aims, both have the well-established goals of forming citizens and forging a common identity. No one challenges these goals, even though the meaning of the words used to describe them has changed considerably since the early 20th century. The prescribed teaching content can be incorporated directly into themes connected with education for sustainable development (this is true, to a large extent, in the case of geography as Doussot demonstrates in his article) or into citizenship education (in geography concerning the relation between citizen and territory, in history where political questions occupy most of the programs). The common set of core skills and knowledge (MEN 2006) for *college* (the first four years of secondary education) defines the aims which are common to all disciplines; social skills and civics, autonomy and initiative are similar to the prescriptions of 'educations for'. The recent programs for *lycée* (MEN 2010 ssq.) also prescribe what pupils are expected to learn including capacities that are acquired for and via reasoning. Above all, the way teachers see it, history, geography and the SES study stream share the same fundamental and founding concerns as an education in critical thinking (cf. LeVasseur and Cardin) a concern claimed also by the 'educations for' especially in the face of the abundance of information and its inconsistent reliability. In fact, this is the object of media education[II][2], an education for, recommended in France since the 1970s.

However, even if their goals are similar to those of 'educations for', these disciplines are not structured in such a way as to engage the actors, to render the values underlying the social projects explicit or to directly influence attitudes and behavior. They may make pupils aware of information they would not otherwise have access to and which is relevant to the 'educations for', but they are still structured by discipline related themes that teachers link more to academic, university knowledge than to the problems in society.

4 The contribution of Didactics

4.1 Disciplinary Didactics, School Disciplines and Educations For…

Teaching is structured around the different disciplines so too is didactics research: actually – and even though the theoretical references may belong to other scientific fields – what is particular to didactics within the educational sciences is its focus on content (what is prescribed, what is to be taught and what is to be learned). Many educational scientists have been trained initially in the scientific discipline with the same name as the school subject. We can distinguish between the different didactic fields because each refers to a particular discipline. Most importantly, the distinction between didactics and pedagogy is that the former is discipline-related; in fact it is this sort of

[2] The French Liaison Centre between Education and Information Media (CLEMI) has been responsible for media literacy in the French education system since 1983. Its mission is to teach pupils to explore the media as citizens of tomorrow by way of partnerships between teachers and media professionals. Media education now implies learning to use Internet. Since 2007, clearer guidelines have been set by the French general inspectorate for education : "In order to prevent media education being considered as a matter for militants and enthusiasts, it seems necessary to take steps towards a more comprehensive approach which is well defined and managed. This is an important challenge which must be met to ensure that our democracy continues to function and basic learning skills (mastery of languages, general knowledge, critical thinking, autonomy, citizenship) are acquired. In order to do this the school system must create the conditions to introduce a minimum level of modern media training into existing programs" Source : eduscol.education.fr/.../education-aux-medias/.../recommandations-fr

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reverence for the discipline "*vénération de la discipline"* (Chevallard 2006) that legitimizes didactics. As we see from the articles in this issue, this orients the questions about 'educations for' in two closely linked directions: the specificities of 'educations for' in relation to academic disciplines (Barthes, Jeziorski), and the relation between 'educations for' and the established disciplines (Doussot; Panissal, Brossais; Richit). This also means that it is the theoretical instruments of didactics that are mobilized to examine 'educations for': here the term didactics is used to denote a well-tooled up methodical study which aims to produce valid knowledge about what is prescribed, taught and learned within a specific discipline. Proposing best practices may be one of the goals of this research but it is neither the sole nor always the main one even if most of the research is also designed to enlighten teachers' reflections and practices.

The didactic fields have been developing now for a good thirty years; they have led to the circulation of models and concepts, to exchanges even to links being made between the didactics of the social sciences[III3] or between the didactics of the sciences and technologies (Hasni, Lebeaume 2010). The 2000s have seen the emergence of comparative didactics: the comparison no longer just concerns the circulation of concepts from a particular subject-related didactic field to another but consists in distinguishing the specific nature from the generic nature within the didactical phenomena and in "updating the respective blind spots" in the different subject-related fields (Mercier et al. 2002). At the moment, the comparative didactic approach is rarely applied to 'educations for', it is however true that this type of analysis could be relevant for the objects taught in all subjects and which the Ministry obliges all disciplines to participate in. What's more, because of the lack of comparative work, recent projects on 'educations for' associate several didactic fields as is the case of research into "education for sustainable development: barriers and facilitators[4]" to which the authors of this text contribute. This research compares several discipline-related didactic perspectives (concerning history, geography, economics, earth and life sciences, chemistry, animal husbandry, agronomy....) and raises the question of "area didactics": the didactics of socially acute "scientific" questions and the didactics of socially acute "social" questions which converge in the analysis of an education for sustainable development (EDD).

This research is consistent with what we can call critical didactics. Starting in the 1990s, the development of a critical didactic trend in the French speaking world, sometimes linked to comparative didactics, seems more immediately relevant to research questions on 'educations for'. This critical trend helps to go beyond a discipline–related structuring of didactics and also redirects research towards the concept of Socially Acute Questions (Legardez, Simonneaux 2006; Simonneaux, Legardez 2011). Other critical didactics related work can be mentioned: the research on Environmental education (Bader, Girault, Sauvé) and also the international trend of Socio-Scientific Issues (SSI) in the didactics of the Sciences. In this case it is accepted that reasoning must take account of the complexity of the issue which necessitates an examination of the question at hand from several angles and also be skeptical about the lack of information

[3] This manifested itself, for example, in the conferences on didactics held at the INRP from 1986 to 1996 (which resulted in a publication) or more recently in the development of a new association for didactic research into history and the social sciences (www.irahsse.org).

[4] Research subsidized by the ANR 08-BLAN-135
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(Sadler et al. 2007).

It is striking to observe how the objects of critical didactics, which all crystallize the values and political choices at stake, converge with certain 'educations for' (environmental education of course but also education for sustainable development media education, education in debating and citizenship education). With socially acute questions, the scope of research into teaching-learning has extended to a questioning of the goals and validity of the content of school subjects and activities. At the crossroads of these different approaches are the issues of values, expertise, media coverage and cultures.

Research work in didactics has specifically studied the epistemological, axiological and social dimensions of discipline related teaching and learning and more recently of 'educations for'. Within this perspective, this research may focus on one or associate several dimensions:

- the socio-epistemological dimensions of academic knowledge as well as the reference knowledge and practices: construction and paradigms of the school disciplines, study of the domains of validity, the modalities for constructing knowledge, the stakes for the actors concerned by this knowledge, the role of models, of the uncertainties and controversies surrounding these references;
- the psycho-social dimensions of the teaching-learning process are studied by way of the representations, lines of reasoning, decision-making and more generally the actors' engagement.
- The operational dimensions with the analysis of educational mechanisms: debates, digital environment, individual work, participatory projects, peer interaction.

In this issue, the articles, in which 'educations for' are specifically questioned, cover these three dimensions and focus on the construction of knowledge and references, consideration of the social representations, the role of values and finally the teachers' instructional posture ranging from neutrality to engagement.

4.2 Constructing Knowledge and References

The methods used to develop what is taught in schools were mainly designed according to two models. The first one is Yves Chevallard's (1985) didactic transposition theory which based on the work of the sociologist Michel Verret and which has spread beyond the didactics of mathematics. Didactic transposition interprets the way knowledge is transformed to make it teachable in schools. It focuses both on the reference to established scientific knowledge and on the profound change in nature this knowledge undergoes when it is prescribed and taught. This model has been extended by adding epistemology to the body of scientific reference knowledge (particularly in the didactics of geography) and sometimes by blowing the whistle on the deformation inflicted on some of the reference knowledge. This model is appropriate for analyzing certain knowledge related to 'educations for', especially because it allows us to consider how this knowledge has been extracted from its original scientific context and recontextualized to make it teachable in schools and how, in so doing, its original creators and the scientific debate over it are both lost.

The other model, used in the didactics of social sciences, is that of the "school discipline" (Chervel 1988, 1995). According to him, school disciplines are structured by a vulgate (what everyone agrees should be taught and learned at School), by the everyday exercises which shape a lesson, by evaluations and stabilized motivational teaching practices, all of which is centered on goals. These goals and the resulting structure contribute to the durability of the school discipline, which responds fundamentally to a social project. Besides the fact that

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it includes teaching practices, the particularity of this model is that it proposes other references for what is to be taught by allowing it to be socially construed, without constituted scientific references, aimed above all else at solving problems encountered in school (this is what Chervel demonstrates in particular regarding the teaching of grammar in the 19th century). Basing research into 'educations for' on this work has enabled us not only to clarify certain differences with other programs but also to consider them as academic creations which may incorporate social knowledge that is different from the knowledge derived strictly from the sciences. From this perspective, values and behavior become legitimate teaching and learning content even in the absence of scientific references.

The contributions to this issue reflect a variety of instructional postures taken when constructing a discipline. The key questions, raised by Doussot, LeVasseur and Cardin or again by Richit, are consistent with identifying or even reinforcing existing discipline based structures. In contrast, education for nanotechnologies described by Panissal and Brossais is based on interdisciplinary knowledge and therefore involves going beyond the usual segmentation. It is therefore difficult to rely on models designed to characterize the disciplines. This may indeed explain why the theories chosen by these authors are rooted in psychology and linguistics.

The epistemological doubt can also spread beyond school, particularly when the knowledge taught cannot be referred to knowledge which has already been institutionalized. So, it may be a question of analyzing the methods used to build the reference knowledge and practices when these are uncertain and non-stabilized as is the case in a number of 'educations for'. These 'educations for' raise questions introducing uncertainties that transcend the sphere of scientific expertise and spark off debate in society, especially in the media. It appears then that it is the goals that, for the teachers, become the reference. This occurs undoubtedly all the more easily because fostering a critical spirit is an academic tradition, which is very common in the disciplines related to social sciences. Faced with controversial references, the goals asserted by the teachers are consistent with a critical perspective. This is the case for environmental issues, economic or social questions in environmental education or education for sustainable development (Simonneaux, Simonneaux 2009) and more generally for socially acute questions. The article by Panissal and Brossais on education for nanotechnologies specifically incorporates these uncertainties so that they contribute to educating for risks. Barthes and Jeziorski, LeVasseur and Cardin and also Doussot confirm the central role of education in critical thinking.

4.3 Social Representations as Analytical Tools in Didactics

Research, which aims to throw light on teaching and above all learning, is mostly supported by models used in psychology and, in the case of the didactics of social sciences, those used in social psychology. The field of didactics for experimental sciences has developed around the analysis of concepts and knowledge (Giordan, Girault, Clément 1994), of history (in particular: Lautier, 1997) or of economics around the concept of social representations borrowed from Moscovici (1976), Jodelet (1989) or Abric (1994). Alain Legardez (2001, 2004) has reinterpreted this concept as a system of representations and knowledge for the didactics of economics and social sciences (SES).

Social representations interest specialists in didactics because they name and characterize a product and a learning process which associates knowledge (held

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to be true and reliable whatever its validity for the expert), values, affective connotations, attitudes and judgments. We can add that researchers see them as springboards for communication, action, and shared identities. In this sense, mobilizing this concept has helped to understand the knowledge acquired, the barriers and facilitators to learning and proves to be particularly useful in the case of 'educations for', precisely because they specifically incorporate both ethical and psycho-social dimensions while targeting action and engagement. The article by Barthes and Jeziorski gives an example of this social construction by demonstrating the impact of the sociocultural and political context on the representations of sustainable development. Indeed, the Polish students' representations were considerably different from those of the German and French students. LeVasseur and Cardin consider the tension between building a collective historical norm and the different representations of history that students are able to develop themselves faced with a changing society and culture.

4.4 Which Questions are Raised About Values?

In the didactics of the «sciences» - the first to be developed – and for a lot of pioneering research, references for what is taught are considered to be stable and valid, an increase in the amount of information or knowledge[V5] acquired by the learners is presumed to foster rational behavior and a critical spirit. Instruction, in an approach which is actually very positivist, ensures education. It is also this assumption that has been implied in the wording of the goals attributed to school disciplines since the late 19th century: acquiring knowledge rooted (or reputed to be) in the sciences, allows the pupil to gain access to rational thought and hence a reasoned social and civic attitude and behavior as well as a way of thinking that banishes outdated prejudices and beliefs. Knowing science encourages democratic values. The educational model may be described as a "deficit model": simply bridge the information gap in order to make good decisions.

In this context, no school time is specifically dedicated to teaching "values", apart from during civics lessons[VI6] and to some extent philosophy (which is only taught in the final year of secondary school in France); values are incorporated into the disciplines. It is accepted that education as a whole helps transmit a model (of citizenship, responsibility, solidarity, etc.) formulated in the programs in terms of the goals of the disciplines. These socio-political functions of school (Prost 1992), asserted as such by the fathers of the state school system, and analyzed in the early 20th century by Durkheim (1922/1968), justify the presence of values, or even ideological positions, in the programs which went virtually unchallenged until the sixties. French history and geography teachers (to take an example which echoes the article by LeVasseur and Cardin) take shaping the future citizen to be a natural aim of what they teach and see the result as a sort of republican neutrality which does not interfere with scientific objectivity (Lautier 1997). In addition, concerning the economic sciences, the debate over

[5] In French we use two terms to translate «knowledge»: "savoir" which refers to a set of concepts and notions elaborated by a (scientific, professional ...) community and "connaissance" which refers to what is learned by an individual about a theme.

[6] Civics –under different denominations- was firstly limited to primary education and then after the Second World War extended into basic secondary education; it is only since 2000 that we find it in all secondary education and all study streams. We should add that it is effectively rarely taught at primary level and in *collège* (lower secondary) (Audigier, Tutiaux-Guillon 2004, Audigier 2010).

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the status of values in the reference knowledge as well as in the knowledge taught at school is an old one but remains lively and controversial. Besides the precursors like Hirschman (1984) or Sen (1999), many have recently spoken out in defense of an economy incorporating or articulating human or political values and principles.

The place accorded to values has gradually been reduced in the second part of the 20th century during a slow process of didactical work on the content taught at school: the need to teach a lot of heterogeneous pupils following the rise in mass education (Merle 2009) gives priority to the contents of what is taught, a mistrust resulting from a questioning of the ideological role of school (unequal academic opportunities, the role of a cultural capital) by the sociology of education (Bourdieu, Passeron 1970), fierce criticism against a nationalist orientation potentially excluding otherness and experienced identities (Citron 1989), leads school to be suspected of pedagogical mystification (Charlot 1976), indoctrination (Reboul 1977) or to transmitting a "hidden curriculum" (Perrenoud 1993). Values become, in a way, "free riders" of what is taught and should be kicked out (Solonel, Tutiaux-Guillon 1999). Didactics research, therefore, rarely focuses on values preferring to concentrate on the more legitimate content of teaching and learning.

This is where the question of 'educations for' has changed everything. Indeed, as we pointed out earlier in this introduction, they are prescribed to address social and political issues which openly challenge values. The texts that define 'educations for' clearly mention values (even if they sidestep the debate on their importance and relevance). Analyzing 'educations for', even from a didactics perspective, therefore requires handling values as teaching content.

The challenge is not only educational, but also democratic. It means shifting education and didactics research from the theoretical framework of the "deficit model" either to a deliberative model or to an "education as praxis" model or even to a dissident and controversial model (Levinson 2011). In the deficit model the didactic relationship is hierarchical and learning what is taught fosters the development of skills. In the deliberative model, there is open discussion with the participation of different actors faced with uncertain or fallible knowledge, even contextualized knowledge emerging and distributed between different actors in the practical model.

This may tie in with another question concerning the emphasis placed in the prescriptions and practices, discipline related or not, on political projects/ideologies underlying 'educations for'... They may be explicit: the model of the citizen or the model of the person may be specified in the goals defined in the texts. Often, 'educations for' target engagement, responsibility, learning to debate and handle information in a society where it is overabundant and contradictory. However, the type of society or political system are very rarely targeted. For example, we can identify a shift from citizen to economic actor (producer and consumer) which also means the political aspect is forgotten. We can question the focus placed on the individual in various 'educations for', to the detriment of a reflection on what is built and determined socially and here again on political responsibility. It is tempting to see in these prescriptions an implicit promotion of political and economic liberalism based on liberal philosophy whereas the objective could be to contribute to the co-construction of a new critical citizenship. New directions for didactics can be found here. The way in which the political interferes with the educational stakes is considered in the contributions made by Barthes and Jeziorsky or LeVasseur and Cardin, the political dimension is at the heart of Doussot's questioning when examining the relationship between what is taught in geography and political skills.

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5 From Neutrality to Engagement, Analyzing the Actors' Instructional Postures in Educations For

Faced with the explicit institutional injunction in educational matters, a lot of research has demonstrated a reluctance to engage on the part of teachers, who give preference to declared neutrality (Simonneaux, Simonneaux 2006). Perhaps more than in anything else that is taught, in 'educations for' teachers are directly called upon as people and as citizens, confronted with their values at the same time as those prescribed or underlying the prescriptions. They can no longer take refuge behind a strictly factual form of teaching; many feel to be ill at ease with this. Furthermore, 'educations for' open up school to agents from the outside world, such as—and more particularly—to certain campaigners. How can everyone find his place? Some teachers have learned a lesson from sociology and think twice before claiming to be "neutral" but they aspire to an objectivity which is consistent with their code of professional ethics. Many consider themselves to be "teachers" and not educators. However, in certain difficult contexts, teachers give priority to learning to live together (Lautier 2002). As there is no consensus on the subject, no homogeneous picture is arising. The question of their position on an issue is a critical one for them, especially when it comes to the transmission of values or encouraging certain behavior and attitudes. And yet this question ties in with the one that faces researchers working on teaching socially acute questions (Simonneaux 2006).

Laurence Simonneaux refers particularly to the work of Kelly (1986) who considers four instructional postures: exclusive neutrality, exclusive partiality, neutral impartiality, and committed impartiality. Proponents of exclusive neutrality believe that teachers should not address controversial topics and that scientific discoveries are value-free truths. Their position is consistent with positivism. Exclusive partiality is characterized by the deliberate intention to get pupils to adopt a particular point of view. In this case, teachers ignore or, more or less insidiously, play down contradictory positions. They believe that pupils should be provided with intellectual certainty – which could come close to indoctrination. This instructional posture is however accepted in education for health where best practices are explicitly defined. Proponents of neutral impartiality think their pupils should be involved in debates on controversial issues within the framework of citizenship education and that teachers should be careful not to reveal their points of view. Certain proponents of this posture believe that it allows them to preserve their authority by masking their indecision or their ignorance, for others, it is particularly important to avoid influencing the pupils' reasoning, even by way of a confrontation with the mindset of an adult who is an expert in the field. In the case of committed impartiality, a posture which is apparently paradoxical, teachers give their opinions whilst encouraging the analysis of competing viewpoints on the controversies. Kelly finds this posture the most defensible because, - presented with the teachers ideas, and encouraged to evaluate the validity of these ideas in an environment which is free from potential sanctions-, the pupils develop skills in civic engagement and resolve. According to Kelly, the balance between personal commitment and impartiality catalyzes critical thinking and civic resolve in both pupils and teachers; the pupils feel more adult.

The arguments Kelly develops, both in his critique of the instructional postures and in his defense of committed impartiality clearly tally with the goals of 'educations for'. In addition, the framework of interpretation he proposes could be useful for elucidating teachers' positions towards 'educations for' inasmuch as these, even outside all controversy, call directly upon the teacher as

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an educational, social and political actor and, if he takes responsibility for this form of teaching, lead him to become engaged.

Laurence Simonneaux's analysis of the educational stakes of *socio-scientific issues* sheds light on what is expected, not only from the teacher's point of view but also from the point of view of the learners, in the field of 'educations for'. The challenges constitute a continuum between, at one end, favoring knowledge which is taken to be stable, thus considering that reliable information is sufficient, and at the other end, fostering militant engagement and thus asserting a political citizenship education. Between these two extremes, we will encounter complex educational challenges (the analysis of controversies and uncertainties, of risks and of values) even critical thinking when making decisions. The challenges presented in the analysis conducted in this issue, fall mainly into the category of critical thinking and do not cross the border into militant activism.

Conclusion

The diversity of the analytical frameworks demonstrates the richness of francophone didactics research in the field of 'educations for'. The work presented in this issue seems to be consistent with the critical perspective which characterizes recent research in the French-speaking world. This research however, reveals the difficulties encountered when trying to integrate educational practices into this critical perspective both from the institutional point of view and from the point of view of the actors of the education system, in particular the teachers.

Is such research specific to the French-speaking world? It seems to us that this critical trend converges with and echoes research on an international level in the field of educational science (Benzce et al. 2009; Kelly 1986; Levinson 2010; Sadler et al. 2007) or political philosophy. It is a political and philosophical question because 'educations for' place learners' conceptions of human beings and of themselves, of society, of the world and of nature or more precisely the relations between humanity, society, the world and nature, at the heart of the issue (Bader, Sauvé 2011). These different conceptions cause friction between the process of an individual's autonomy and the acculturation process, in asserting one without wanting to exclude the other. On top of this, there is friction between the present and future self because 'educations for' encourage, even require, an individual to project himself, society, nature into the future. This projection will also unavoidably affect his relation to the past (Koselleck 1990; Angvik, Von Borries 1997). At a time when our increasingly individualistic society finds itself confronted with a multitude of (environmental, economic, political) crises, it seems to us to be both important and logical that this friction finds its way into school.

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Sylvain Doussot

Geography and Political Skills: A Case Study in a School of Education

This article is a case study based on the work of a group of students being trained to teach. They design a lesson for 10-11-year-old pupils on geography and education for sustainable development and aim at linking civic and social skills to scientific geography. This goal is changed in this case study when the prevailing idea about relations between school knowledge and "…educations" (citizenship education, environmental education) is put into question: disciplines such as geography are *serving* the development of citizenship skills in order to promote a critical education instead of a standard one. Furthermore, based on philosophy, history and sociology of science this case study offers alternative ideas of understanding how pupils can become critical citizens. These ideas focus on the hypothesis regarding a general skill often unseen though essential to any critical approach to world problems: which knowledge should be used when? In this perspective, geographical knowledge refers less to "knowing something" than to scientific, collective and linguistic practices specific to the viewpoints of various scientific disciplines, in particular the construction of spatial problems.

Cet article est une étude de cas basée sur le travail d'un groupe d'étudiants en formation pour devenir enseignants. Ils travaillent à construire une séquence pour des élèves de 10-11 ans en géographie et EDD. Ces deux thématiques s'articulent dans le développement de compétences civiques et sociales, et du savoir géographique de référence. Cet exemple constitue un cas dans le sens où il remet en question une idée dominante concernant les rapports qu'entretiennent les savoirs disciplinaires et les "éducations à": les disciplines enseignées seraient *au service* du développement de compétences citoyennes, dans le but de permettre une éducation critique plutôt qu'une inculcation. Au-delà de la remise en question, ce cas donne des pistes alternatives qui s'appuient sur la philosophie, l'histoire et la sociologie des sciences pour penser le développement de l'esprit critique des élèves. Ces pistes travaillent l'hypothèse d'une compétence générale souvent non questionnée, mais essentielle dans toute approche critique du monde: quel savoir utiliser à quel moment? Le savoir géographique réfère alors moins à des savoirs propositionnels qu'à des pratiques scientifiques, collectives et langagières, propres au point de vue spécifique qu'institue la discipline de référence. En particulier, la construction de problèmes spatiaux.

Keywords
geography, criticism, skills, problems

1. Introduction

Fifteen students of a master degree program (education, teaching and training for primary school teachers) are involved in a course named *Teaching geography and education for sustainable development, critical approaches*. 15 hours out of 30 take place during the first semester and focus on designing a course for 10-

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11 year-old pupils on a local issue: the upcoming opening of a tram line in the Nantes urban area. This issue links the teaching of geography to education for sustainable development: will this tram linetrack do good to the people and the environment? The students' work is organised around this town and country planning project and aims at connecting the learning of geographical concepts and approaches (on the planning of a metropolitan area, scales and density) with the development of political skills that are supposed to foster the learning of citizenship in regard to sustainable development.

Actually, this intention determines the structure of the training course. What the students do with it is what matters here: this paper deals with how the students, in their attempts to combine geography and political skills, end up challenging their first attempts to use geographical knowledge to provide political answers.

The question *What is disciplinary knowledge good for?* could be the guideline of this case. It indicates the scope of the questioning: sciences – including social sciences – are constantly looking for a balance between independence from society's requests and a normative stand point; they challenge questions built upon the stream of everyday life but claim they tell the truth about it[1]. While science is somewhat detached from society, it is not aloof of it. I.e., it claims to inform political decisions from its more panoramic point of view, but not to guide them. In society and at school, the relationship between knowledge and action can be depicted through the following linear pattern: political question → detour through knowledge (scientific, school) → back to the question (see Audigier et al. 2011).

At school, projects to educate pupils in sustainable development are thus implemented in classes where teachers apply knowledge from different disciplines (Maingain, Dufour, Fourez 2002, 83) in order to bring up non-disciplinary questions (Audigier 2001). In the media, experts recognised as scientists answer journalists' questions, or are asked to debate among themselves about questions from the everyday world. They are expected to use their specific knowledge as a resource to solve political problems.

As the teacher responsible for both designing and implementing the course, it struck me how – from time to time – students deviated from this usual pattern. This is the reason why my initial purpose in recording what the students were saying and writing changed: instead of focusing on their suggestions, I started focusing on these specific moments when they challenged the knowledge-as-a-tool pattern (section 4). For that purpose, I will display the general structure of the course and the role played by the training device beforehand (section 3).

However, this study cannot simply describe what happened: it has to clarify the theoretical background of the description, along with the hypothesis involved.

Any didactics study relies on the comparison between the science at stake (geography) and the related school subject-matter. The gap we have previously underlined between the constant effort that science makes to build a specific distance with the world and what happens at school and in the media can be the source of a first didactical hypothesis. This way of making use of knowledge in school projects ignores an obstacle in educating pupils in sustainable development and, generally speaking, in citizenship education, in particular, regarding their relation to specific knowledge: the ability scientists show to

[1] Didactics as a social science is in the same situation: in that respect, "(school) world ask didactics researchers for direct prescriptions" (Joshua & Lahire 1999, 36) while didactics researchers, acting as scientists, try to keep social demands at a distance.

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choose which knowledge to use in which situation. This ability is not a mere technique but relies on the whole community (of geographers, for instance) whose autonomy has emerged from the construction of specific tools and practices. When geographers design a concept such as urban sprawling, they intend to rise above common sense categories and dichotomies (suburbs, town versus countryside, etc.). But autonomy does not magically derive from the concepts themselves; it mostly comes from the vindication of the relevance of these mind tools: some settle while others disappear in the course of investigation. Can education for sustainable development school projects ignore this essential process of construction of knowledge?

In that respect, we shall first try to depict this gap through history and sociology of science. That is, on the scientific empowerment process (section 1) that leads to substitute problem-building to problem-solving (section 2). This should help us understand why our students sometimes seem to be uncomfortable with the political instrumentation of geographical knowledge.

2. Science as an Autonomous and Legitimate Outlook on the World

This general skill – to know when to use which knowledge – is often ignored in official texts. Let us look at two examples at two different levels. First, it is left out in the latest texts published by the Ministry of Education to help teachers implement case studies in geography. The texts systematically refer to a split between the pupils' work on documents and the teacher's role to "put into perspective": the choice of relevant concepts is the teacher's responsibility only. Second, this skill is overshadowed in the multiple examples shown by the Ministry of Education, such as in the following:

> "In the third year of secondary school, pupils have worked in history, geography and maths through an IDD (*itinéraire de découverte* = discovery path) about fair trade. The final item was the planning of two meals at the school cafeteria with fair trade products. The construction of the menus and the cost calculation of the meals showed the pupils that solidarity costs money for northern countries' citizens"[2].

Why take this cost criteria into account, except to support the involvement of mathematics? According to which reference? These questions do not belong to this presentation: there are no justifications of them for pupils, nor for teachers who would like to work with this example. The relation between facts, arguments, and assessment criteria is not taken into account as if it were obvious. This seems to be strongly different from what happens in the scientific fields.

2.1 History of Sciences: How to Create a Suitable Detachment from the World

The history of the sciences tells us how they progressively develop, aiming at building up a position somewhat detached from the world: neither entirely embedded into empirical observations nor fully regardless of them, they constantly move between from radical empiricism (embedded) to scholastic positions (that moves towards loneliness). The search for objectivity and control over subjectivity is at the heart of the gradual construction of scientific communities separating from the rest of society. This autonomy is the main support of the critical dimension of scientific knowledge, and this process has

[2] http://eduscol.education.fr/cid48498/developpement-durable.html#sensibilisation

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led to more and more specialised realms of research, which means more disciplines as well as borders between disciplines. However, autonomy simultaneously exposes scientists to the risk of forgetting the relationship of their work to the real world, because the texts they work on are a representation of the reality only. This is the reason why this process has gone together with its opposite: not only have these communities studied the world (in a descriptive and analytical perspective), but at the same time they have endeavoured to take into account the relation between the data and the accounts that they produce[3] (Boltanski 2009; Bourdieu 1997; Berthelot 1996).

This phenomenon is more recent in social sciences than in natural sciences and gained strength throughout the 19th century in Europe. Thus, in history, Grafton (1998) showed how tools and language operations as they appeared in communicative situations materialized in footnotes and lead to the emergence of critical history at the turn of the 19th century. Footnotes are an annotation to fellow historians' accounts (past, present and anticipated) supplementing the narrative text (mixed with quotations of historical sources). They thus play a part in the implementation of dialogue that guarantees a triangulation between relics of the past, accounts and critique.

Thanks to sociology and history of sciences (Fleck 2005; Bourdieu 2001; Pestre 2006) we can figure out how far scientific activity seems to be from a common sense interpretation merely linking a subject (the scientist) and an object (the world). According to Bourdieu (2001, 151), sciences rather operate on "a relation between subjects (all the agents engaged in the field) about the relation between the subject (the scientist) and his object". Thus,

> "scientists are never lonely geniuses as put in hagiographic history; they are collective subjects who, as embodied collective history, make present all the relevant history of their science (…) and work among communities with instruments that are also objectified collective history" (ibid. 139).

Thanks to this shift we are able to account for the scientific generalisation showing that "science is a construction that set out a discovery that overpasses the construction and social conditions that made it possible" (ibid. 151).

2.2 Science and Appraisal

The distinction between science and expert scientific appraisal given by Roqueplo (1997) accounts for this specificity on a synchronic level. An expert is a scientist who loses his autonomy by answering questions he does not choose. Moreover, appraisal texts and scientific texts are nearly the same.

A scientist who takes on a political stake not only gives away his usual activity of examining problems ("the construction of research questions is an essential part of scientific investigation and the art of the scientist dwells in his ability to ask the 'right' questions, that is those which are scientifically fruitful", Roqueplo 1997, 36), but he gets involved in the scientific appraisal field while taking the risk of mixing things because both use the same words. Indeed, the statements' backgrounds are different: one does not speak to high ranking officials like one does to other scientists in a conference.

It is actually "through their effective capacities to translate social and political questions they are asked (or they have to answer) that sciences of the social

[3] Bourdieu (2001, 138) states two specifications for the scientific field ("champ") "closely linked: closing (or pairs competition) and arbitration of reality".

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world prove their scientific strength and vitality" (Johsua, Lahire 1999, 36). As Roqueplo puts it, when a scientist becomes an expert, he "inevitably breaks the borders of his own knowledge" (1997, 20). Thanks to this distinction we are able to specify the scientist's main activity compared to that of the expert: he builds or rebuilds problems by establishing them in a field of knowledge structured by its own tools and its own means of communication.

Confronting both categories (scientist and expert) enables us to escape from a purely theoretical approach of scientific investigation[4]. Concepts are the instrumental frame of science, but they do not have any scientific value outside a community that ensures the critical role of these tools through specific ways of thinking, talking and acting (Berthelot 1996; Bernié 2004; Jaubert 2007). To make a long story short, conceptual tools and academic practices are bound together (Bachelard 1949), and they give its scientific force to knowledge which is thus made of statements along with their conditions of production. Thence, what happens when one takes these concepts into another community? What happens when they enter classrooms? What happens then to the critical value of scientific knowledge?

2.3 Science, Practices and Instruments

These questions confront us with a didactical problem. In a recent study, Audigier et al. (2011) worked on an issue they qualify as "detour/return", according to which studying social and political situations at school requires for pupils "cognitive resources" from social sciences (among them geography). Their paper actually challenges this linear sketch: although these resources are made for "giving details on the knowledge" and "providing a frame to analyse and interpret data" (Audigier et al. 2011, 58), there are no mechanical links between scientific disciplines and political questions. The study of schoolroom situations framed according to this pattern lead them to conclude that the abilities that pupils must develop are based on the fact that "knowledge is transformed by an imaginative interpretation that calls for a strong culture of interpretation" (Audigier et al. 2011, 231).

It appears to me that we should try and imagine how the relationship between these general principles (such as "culture of interpretation") and the real world of the schoolrooms could be figured out. In order to understand how the pupils "should be taught to use these tools to understand the situation and its issues" (Audigier et al. 2011, 55), we certainly must open this black box called "the study" of the situations, and clarify the difference between knowledge as text, tool and practices, as well as the "universe" in which they make sense. Critical anthropology (Bensa 2010) is warning us about categories such as *culture* which may prevent us from considering strategies (thus tools and practices), as if the cultural context was controlling behaviours.

For that purpose, discipline tools should not be considered as separate from knowledge, but rather as part of it. Under such a proposal, tools are simultaneously material and mental. Based on Vygotski's psychological instruments, Rabardel (1995, 1997) has created the idea of tools as "mixed bodies" that are both artefacts and individual schemes. According to him, "the instrument changes some functions with others, rebuilds and reshapes the whole behaviour structure. The explanation of the upper behaviour types relies on the means that allow man to control his own behaviour" (1997, 37). Thus, theoretical

[4] At least on that point Bourdieu and Latour meet: "focus on practice – including theoretical practices – rather than linking concepts" (Latour 2005, 253).

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instruments can only be thought of as emerging from a process of collective "instrumental genesis" which denies that users and designers are relevant divisions. On the contrary, that scientific tools cannot be understood as simple artefacts provided by others to be handled according to written procedures. They have their effect on their users' mind while the users become designers of their tools to a certain extent: making use of the tool for their own purposes (what Rabardel calls "*intrumentalisation*") while modifying their own action schemes (what he calls "*instrumentation*"). In our case study, tools such as the set of scale in geography or the various aspects of the notion of distance can be seen as part of instrumental genesis.

By following these considerations, we aim to avoid imprudently linking scientific and school practices and underestimating the complexity of the relation. Rather we consider scientific concepts as independent and collective tools (not designed to answer questions from outside the scientific community). This should be the ground on which to rest a comparison of collective tooled up practices in both communities (the scientific one and the classroom): on the condition that we hold together the development of skills and the transformation of the classroom into a relatively independent and specific to the subject-matter community. We therefore refer to the notion of "discursive community" (Jaubert 2007) based on the switch-over from an everyday type of discourse and action to a scientific one, through the transfer and arrangement of scientific instruments into the classroom (Doussot 2012).

3. From Political to Scientific Problems

In order to conduct such a comparison we now have to inquire how scientists handle the construction of scientific problems out of everyday questions. As seen earlier, a scientist – but not an expert – focuses on the construction of problems with specific tools and collective practices; but we also stated that this process should focus on the assessment of the relation between data (facts) and accounts (arguments). This specifies the problem-building practices under way in the scientific realms. What does it mean outside these realms?

3.1 The Problem and the Test

Framing a geographical problem can first be seen from the perspective that living in the world means that you are regularly under stress to make decisions and compare possible solutions (Fabre 2003). In that case, problems and solutions are always bound together by previous experiences and remembered through practical knowledge. When new situations arise, various answers can thus be inspiring. Afterwards, reality picks up the relevant answer. That is what happened to Phileas Fogg whose bet to travel around the world in 80 days (Verne 1873) was based on his knowledge of the world transportation system, and tested by the actual journey (Fabre 2003, chap. 3). The trouble emerges when what is at stake requires a collective decision and cannot be easily verified (as for town and country planning: any test would be extremely expensive). In that case, the risk is high that we talk about solutions without envisioning the problem at stake, as seen in numerous media debates.

Another option would be to assess these available solutions in order to construct the problem which was disclosed by the starting question (in a process called *problématisation* – problem-setting – by Fabre 1999, and Orange 2005). We could then escape from the linear approach (from questions to solutions

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through the shift of data into evidence) by figuring out and discussing what it requires to accurately change data into evidence.

In the case of Phileas Fogg, this would mean to add schedules and length of the journeys to the different means of transportation to assess which ones would be the best suited. Results would be assessed according to the following requirements: "if there are no blanks in the web and if the following means of transportation only leaves after the arrival of the former" (ibid. 68). But the best way – in Verne's fictitious circumstance – is to travel: this means validating the hypothesis with reality.

This case is, however, barely relevant for sustainable development issues, for this kind of validation is too costly or impossible in such issues. We have to rely on debates and knowledge, whereas decision is often compulsory and thus made without calculation (Roqueplo 1997).

3.2 Concepts and their Field of Relevance

This problem building approach provides us with some analysis tools: experience-based answers, data and requirements for data to become evidence have to be used together. But these tools do not supply people with fixed strategies: combining possible answers, data and requirements depends on the problematical background through which the world is viewed. In the *Tour du monde en 80 jours*, one can identify "three problematical backgrounds: the transportation network engineer's, the travellers' whose aim is to race through this network as fast as possible, and Detective Fix' whose problematical background is to catch Philéas. From one background to the other, the problematical tools get new functions: there are no answers, data or requirements in themselves (…). A micro-world can thus be described as the unity of numerous problematical backgrounds, as a cross of problems: each one defining the functionality of its components" (Fabre 2003, 71).

In a way, this means there is no circumstance without problematical context. Every time we try to understand a circumstance we talk about data, requirements and answers. However, we can face problematical backgrounds more or less visible and structured. When this is about training for civic and political issues (unlike Jules Verne who takes his reader to local issues), debates need to be openly expressed and developed to lead to a collective decision that relies on specific reasons. The accumulation of reasons thus requires the formulation of a collectively accepted problem rather than the simple comparison of possible answers.

3.3 Back to Our First Hypothesis

The scientists' specific ability to choose which knowledge to use according to the question asked hides a deeper problem that makes it difficult for teachers to figure out how to link the knowledge of a discipline to the development of citizenship skills.

Scientists rather change the question than choose the right knowledge (concepts, facts or statements) to answer. Indeed, they focus on the available answers and their justification according to their realm of knowledge (what Bourdieu (2001) calls their "equipment": accounts and instruments made over time by the community) to redefine the initial problem. In doing so, they do not directly use their knowledge to help people make a decision, unless they act as experts. What does this tell us about schoolrooms?

It can first be stressed that the usual way of connecting disciplines to political

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skills in order to engage sustainable development problems at school refers more to the expert's way than to that of the scientist (Doussot 2012). But this may create problems: since pupils are all but experts (say, in geography), their lack of knowledge may be patent, and prevent them from finding any satisfying answers (without the teacher's help or validation). On the other hand, the scientists' approach may appear unreachable for pupils, since the school context is significantly different from that of the scientific community. However, the ability of formulating problems from shared questions may appear essential to future citizens[5].

These are the foundations for entering into our case study, eager to understand the surprising moments when students pass from the experts' way to that of the scientist.

4. Students' Epistemological Strategies

The raw corpus of this case study consists of the recordings of the discussions among the students who have to elaborate the school project (groups of 4-5, all groups together with the trainer), along with the writings they produce and modify through the four courses. The present section is described and analysed according to the previous issues (sections 1 and 2). It also shows how I, as the trainer, organised and guided their work: my task as a trainer is to have them find ways to connect geography learning and the development of political skills. This is based on regular questioning about assessment of their proposals: will the pupils learn geography? Will they develop one of the political skills at hand?

4.1 Learning Geography to Solve Political Problems?

According to the usual approach for a project-based session (*versus* a curriculum-based session), the starting proposals of the four groups of students are focused on the outputs the pupils are supposed to produce. These outputs directly show the way students consider "education of choice" (one of the main aims officially defined for sustainable development education, and the objective stressed at the beginning of the course), and the part geographical knowledge should play in such projects.

Group 4 plans to have the pupils work on an advertisement poster to promote the tramline. The search for arguments in favour of this construction is discussed by the students who try to help the pupils inquire about advantages. Here, geographical knowledge is only considered as a medium for illustration (for instance, they plan to ask pupils to sketch the location of the tracks). Two other groups (1 and 3) suggest that pupils could create an exhibition to be seen by families and other pupils. Group 1 wants to state "benefits and problems". According to their writings, the political issue is to be raised in accordance with a media-type debate presenting various answers (positive and negative). The first part of their lesson would ask pupils to compare the tramline with automobile in a questionnaire for families about the way they commute. The exhibition planned

[5] "The possibility to build (or re-build) problems is the most visible evidence of freedom of thought. Democracy cannot be based on a bounded-freedom that consists of solving problems set and expressed by others, or of casting a vote for this or that answer. The actual participatory - or outreach - citizenship (the one which is precisely under the idea of sustainable development) calls for a right to set problems and simultaneously to denounce non-problems (Deleuze 1969)" (Fleury, Fabre 2007, 77).

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by group 3 is about the possible changes in the landscape after the construction of the tramline. It would be achieved through various unconnected activities about transportation habits of families and decision making for such a construction. This landscape analysis is a traditional activity in school geography and has little to do with a scientific approach of space set in contemporary geography[6]. In both groups, geographical knowledge is not used to cross-examine a town and country planning policy but rather to illustrate or describe it.

The last group (2) goes further into the political dimension of the project. They plan to ask pupils to write a press notice for a local newspaper through a journalist-like inquiry (interviews with operators of the tram project, use of maps, questionnaires for the local inhabitants). The final product – the paper – is the logical output of the entire inquiry process that frames the lessons. We can assume by reading their proposal that this process is aimed at avoiding instilling the right way of thought and allows the social and civic skills at stake to be practised through the contradictory speeches found (that is "knowing how to assess subjectivity or partiality of a speech" and "knowing how to distinguish rational arguments from statements"). However, there are barely any differences with the other groups in the way they consider geographical knowledge: it is considered as a simple tool that is to be handled appropriately to find answers to political questions. As they put it at the end of session 3 of their project: "the idea is to explain the pros and cons as a result of these considerations".

4.2 Back to the Geographical Knowledge at Stake, and the Idea of Skills

The second lesson with the students was elaborated according to these observations stating the deep disconnection between geographical knowledge and political skills at stake, and especially the poor questioning on the function of this knowledge. It is thus based on a few scientific papers such as one by J. Lévy (2010) of which the main point is the fundamental part played by the concept of density (of people, housing, jobs...) in understanding how cities grow and are organised. Students work on that paper in relationship to the local situation of the peri-urban city where the school is supposed to be. This paper touches on "the urbanisation of the suburban areas" (50) to envision an alternative to commuting for work, whether by car or by tramline. Through this extension of the possible answers, the political issue is changed to some extent: from the initial pollution problem to a job-housing distance problem which can be solved through mobility or co-spatiality (Lussault 2007, 56-58). These geographical concepts are then discussed among the students.

The word "*périurbain*" in the "*Dictionnaire de la géographie et de l'espace des sociétés"* (Lévy, Lussault 2003) is also studied to characterise the peri-urban cities (discontinuity, low density, low diversity) in order to consider possible requirements for public transport, along with access to the tram option (this article insists on the idea of accessibility). Finally, the word "*Métropolisation*" from the same dictionary helps students to take into account the multiple scales to understand town planning, from the urban area level to the world level. It also emphasises that these different spaces are connected by relations of power, especially the power of a central city over peri-urban cities, along with the power of Paris over the regional citiesmetro.

This work on papers is completed with one lesson to clarify the concept of "skills", which is then compared with "competencies" at the beginning of the

[6] Only 4 among the 14 students have geography degrees (most of them graduated in history).

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third lesson. This notion is studied using excerpts from a text by Rey (1996) which emphasises the difference between procedural skills (that can be trained and are valid for related circumstances) and general skills (valid for various circumstances). The political skills the students choose to put at stake for the pupils (*knowing how to assess subjectivity or partiality of a speech*) belong to this latter category. This work on skills is completed with a paper by Audigier (2009) stating the necessity to "introduce pupils to subject-matters concerns" along with skills. Let us now concentrate on the third and the fourth lessons in which the students use these papers to work on their classroom projects again.

4.3 The Development of the Relations Between Geographical Knowledge and Political Choices

Initial projects have been modified, and I focus my questioning on the space they open up for geographical knowledge to accumulate.

The students' work on papers (all groups) first show a list of elements in the first column (of the table requested by the trainer) – "knowledge/skills" – that do not connect together. However, they also display the will to develop debates between pupils' points of view and those of the project stakeholders; direct or indirect discussions (through the writing of a press article, for example) are imagined that aim at linking political skills and the understanding of the town and country planning situation.

This can be identified in group 1 when they suggest the pupils write to the mayor to adapt the new parking project according to the possible traffic increase in the area of the school: "through this letter and the answer, pupils – who may disagree among each other – would certainly call into question their opinion in order to find a common statement". This discussion is based on a fictitious issue: the extension of the parking lot would shrink a parkland. To show the negative impact of this project, the students plan to "have the pupils use their geographers' skills through maps and sketches; and their citizen's skills confronted with the environmental issue and the relations between various stakeholders". The geographical knowledge keeps serving a cause – a "noble" one: environment. In this group of students, knowledge and skills are used to design a structured school project, but the "noble cause" at stake is not called into question. In that respect, there would be no problem in the classroom: neither geographical, nor political; in the students' view, it is just that some people go wrong or are not environmentally aware.

In group 4 a meeting is planned to talk with a representative of the local assembly: "we will check that pupils' questions are focused on the impact on school and pupils (as citizens) instead of on the general impact. Work on geographical problems and concept of scale (to think local)". Though short, this excerpt suggests that pupils could see the difference between the global approach of the representative (at the urban area scale: which is the usual scale for town and country planning projects as can be read in all official papers) and their local approach (city and school area). This would give knowledge a new place in the learning context: instead of being an external resource, it would be part of the process that gives them access to a political issue. Since they will have to discuss questions about the school area to talk with the representative, they will need to change scales to match questions and answers. This is a critical point for our study that the last two groups also display.

Starting with their initial idea to separate benefits and disadvantages, group 2 now plans to bind them with the notion of scale through "various sketches" taking together local and global scales: "the idea is to explain benefits and

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problems as a result of notions [cited before: urban area, metropolisation, density]". Here too, geographical knowledge is no longer a mere tool serving the political issue: it rather gives a clearer understanding of the political statements. We can thus assume that the number of benefits and disadvantages will not be the solution to assess the issue and lead to a decision. Assessment according to geographical criteria will rather fulfill this role by "explaining benefits and disadvantages".

This is also visible in group 3:

Activities	Knowing / knowing how	Justification
6. Prospective work → jaunt + pictures of Clisson	City and neighbourhood landscape study	Understanding urbanisation
7. Thinking about the impact of tramline	Gathering subject-matter knowledge	Knowing how to elaborate an individual opinion
8. Meeting with the mayor in connection with the scenarios of city development	Knowing how to distinguish rational arguments from statements	Developing citizen attitude

In the left column ("activities"), "prospective", "impacts" and "scenarios of city development"[7] (action plans) show a considerable relation. In this group, the idea of prospective work comes from a professional dimension of geography: geographers can work for local communities to help in designing the future. Based on this professional practice[8], students connect geography to political issues as it is done outside of school: as a field of expertise. But what kind of appraisal is it? An appraisal to design arguments for a pre-existing answer, or to help decision-makers to think about it (see 1.2 about Roqueplo 1997)? What we know from their table (line 8) is that this appraisal should end up in a discussion with a stakeholder: a critical discussion (see central column "knowing/knowing how" and right column "justification"), the main point being that the meeting with the mayor should be "in connection with the scenarios of city development" which assumes a previous geographical check.

Our interpretation of their table is supported by the recording of their discussions. In fact, "meeting with a representative" is the activity that is planned first. But facing the difficulty to cope with a critical approach for pupils (the skill they aim at developing), they consider using the last activity they planned (scenarios of city development) in relation with geographical knowledge. At this point of their argument, the professional practice of geography is used as a go-between in order to make the visit of a project stakeholder in the classroom meaningful; the idea being that pupils would lead part of the discussion instead of listening to a ready-made speech of the representative. Using a power-point in this context derails any such effort. As the students say: "bang, this is a catastrophe", as its makes it highly difficult to interfere with the instructor's presentation and to initiate a debate (511-512[9]).

This essential step in the way students take scientific knowledge into account when dealing with a political issue has to do with the idea that knowledge serving politics does not work that well. What is at stake in this group is to find a

[7] The recording of their discussions indicates that these scenarios are supposed to describe the city surroundings after the implementation of the tram-train. They would be made out of questionnaires to the families.

[8] There too, the recording allows us to identify the source for this idea. One of the students who graduated in geography takes up an idea stated by the trainer (lesson 2).

[9] These figures relate to the transcription of the whole lesson 3.

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way to design a new possible connection between geographical knowledge and political skills. This may give us access to the reasons why they could not simply do as usual.

The peculiarity of this case is essential for shaping new links. Its double dimension (students thinking about how pupils would manage) is a critical point for my inquiry in that it provides students with a go-between object. The mediation of the pupils gives them opportunities to discuss and find possible answers to questions about the relationship between knowledge and action. We focus on group 3 for which I identified two key-moves (discussion excerpts used below are chosen according to this issue: they show when students question the weakness of their usual approach). In the other groups, the students show less discomfort with these weaknesses.

5. Geographical Problems, Didactic Problems and Political Problems

Our analysis of group 3 displayed the way these students try to go beyond the list of activities and knowledge. This is in fact the result of a long process of discussion among the students, especially during the third lesson. For the first 45 minutes they resume the initial work (from their table): "we could add another activity" (312), "That's already enough" (314), "since we still have to deal with the skill *acting as a citizen*" (315). But after that, they gradually work on the logical connections between activities because of the trainer's requests.

5.1 Handling data means assessing their argumentative value

Our first episode focuses on the efforts the students undertake to link two activities they initially listed: a questionnaire about the everyday commuting patterns of the families – before and after the setting up of the tram line – and a list of available transportation means:

319	D	OK, good, then let's recap the three lessons. First, they design the questionnaire they will give their parents. For the trips. By the second lesson, they have collected these questionnaires, they draw a sketch including arrows...

331	D	Then, second lesson... then they draw sketches with... the questionnaires they received. Then there... they have an idea regarding the trips according to the different... to the two scales.

Activities are designed for pupils to get closer to geographical knowledge ("the new geographical structure of cities": 332), in order to achieve the learning goal. This is done through a common geographical practice: "they'll have to make another map" (336). Moving from one activity to the other to learn geography entails handling data (facts about the local situation), but also integrating these data into geographical concepts ("the two scales": 331). However, the students always relate their goal to the "real[10]" situation: listing benefits and disadvantages of the tram line (this is the 5th activity in their table) in order to rationalise the political issue ("Using, hum..., using their own car, or by train, but this is much less flexible, see": 339; "We have to write down benefits

[10] This refers to the opposition enlightened by Boltanski (2009, 93) between reality and the world. Here the situation is real in that it ties in the students' representation of the world.

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and disadvantages": 342). All this leads them to design a tool to appraise their findings: "well a table, to be filled up; exactly; a comparative table" (343-345).

This is the moment when geographical knowledge becomes important as a way to put the didactics problem the students have begun to see into perspective. They notice that the choices to be made to build the comparative table cannot be based on simple trips from one point to another:

346	B	Yeah... but I don't know, it is easy to say that the tram is a choice, but they don't know if it starts from home

Since they are aware of how regional cities such as Nantes work (lesson 2: scientific papers), they have to set this comparative transport problem up geographically:

357	D	This is to go into Nantes here, those who live in Nantes
358	C	Well [reading the papers] those living in the Nantes ring road. Is it OK?
359	A	No
360	C	Hum Clisson is on the outskirts of Nantes
361	A	Oh, outskirts? I thought it was about the ring road
362	C	You're right, the ring road. Are there any differences?
363	A	Of course
364	D	What is it, could you repeat?
365	A	Ring road means around Nantes
366	C	Oh, ok
367	A	Well ok, but, however, it is also used by many people dwelling there
368	C	Wait, residents inside the ring road, residents outside the ring road
369	A	Ah ok, yeah, there you go, then this matches... well we'll find them anyway. So

Here, the students show they have difficulties dealing with the questionnaire for the families, so that they must have it interpreted by the pupils in relation to all the possible trips. That is, they have to think about the tram line solution as one of a set of possibilities[11] processed by geographers. By doing this, they face the pupils' difficulties which they had anticipated (346), but also their own difficulties in figuring out the issue (357-368). They thus start to sketch a geographical problem of zoning[12] using the case of commuting to work. The comparative table of means of transport cannot be easily thought out – in an empirical way with data from the pupils – without using geographical zoning conceived upon how a metropolitan area works (outskirts, urban sprawling,

[11] See Boltanski (2009, 24-25). Sociology separates from common critique since it follows two steps: "getting out of reality by imagination first means to deprive reality of its implicit necessity in order to do as if it was arbitrary (as if it could be different or could not be at all); this leads to a second step: getting reality back with necessity. This move gives necessity a global reflexive feature; namely, local necessities are now referred to as a set of possibilities".

[12] Here I follow categories set by Lussault (2007).

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housing, job localisation...). Though this issue is barely touched upon at that moment because of the lack of information, it leads them to a new problem based on the need for everyday commuting and the location of jobs and housing (and the distance between them). This problem is then considered.

This first episode can be interpreted as the outline of the problem. The initial didactical question (how to help pupils learn geographical knowledge) is dealt with in the following way: giving them a map to draw, having them fill out a table. Working on the data (locations, distances, existing transportation web, etc.) to obtain answers to this question leads the students to theoretical and complex geographical knowledge: they anticipate that the difficulties they face will be difficulties for the pupils as well. Comparing trips (to choose the best one) means locating them on the functional zoning of the urban area. If these concepts are only words at first for the students (after lesson 2) then they become useful as analytical tools over time capable of dealing with data and to assess the various hypotheses. As conceptual tools they can only be used under specific conditions which give these concepts their specific value over simple vocabulary. Requirements stemming from zoning, urban area, peri-urban sprawling and other concepts guide the search for new data (new transportation means according to their location in the urban area) and how to deal with them. A possible extension to what they achieve here could be to do another questionnaire to bring new data according to these new concepts (asking, for instance, whether people would prefer local jobs or new means of transportation).

5.2 The geographical problem gives meaning to the political problem

The second episode shows up when the students put the interview with the mayor into perspective with the pupils' work on the different *action plans* (see section 4.3). This can be seen as a radical change in relations between knowledge and action: data (such as the mayor's speech) depend on the conditions in which they are valuable (such as the role the mayor plays in the project). This can be so in the students' discussion which leads them to abandon their usual empiricism and directly confronts their perception of the world.

Between those two episodes, the students try to put their proposals in line with the curriculum requirements. They do so by listing their planned activities as landmarks in their work. What they call "decision-making process" and "scenarios of development" are the two important activities in this second episode:

422	A	I do believe it's important to let them know the decision-making process... It does not just happen

515	B	I don't know, otherwise we could link to... link the interview with the mayor to the scenarios of development, you know what we said we were keeping for the end

As in the previous episode, what is at stake is how to link activities:

426	A	I would see this afterwards... and I would include this... it would be OK to do this and the decision-making process
427	B	Yeah, right, I would link both but not...

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428	D	Why are they going to make a tram line anyway? What are they doing that for?

The first idea is to play with both the decision-making process and the advantages of the tram line. For that purpose, they consider asking a stakeholder of the project to come and explain the positive aspects of this investment.

430	C	OK then we call the lesson… yes... I don't know, why the project...
431	A	The birth of a project.

442	B	Getting in touch with these representatives to learn how this decision was made

But soon the students put into question knowledge as a true representation of objective facts (here the organisation chart for decision-making in such a project), the citizen skills and the ability of pupils to understand:

443	A	And if you want to act as a citizen, you have to know who you are talking to... In what background you...

Their own difficulties lead them to anticipate those of the pupils:

457	C	I do consider that we often lose time, well, when..., because these are very complicated issues, I am not sure the pupils... have much to say about that, you know.

468	B	We do not know, then teaching 10-year-old pupils...

514	C	You're gonna lose those little kids

On the other hand, the textual nature of the organisation chart is not compatible with the idea of developing citizen skills.

Finally, geographical concepts again appear unavoidable for dealing with the emerging problem. Understanding the role and the place of the mayor depends on the place in the project and scales at stake. One cannot understand the chart if one does not localise the stakeholders in the operation of the city:

448	A	Yeah because I think that in town and country planning everyone has a specific role
449	D	Yeah while here we are not talking about the township any more, but the whole urban area
450	A	Yes
451	D	Or maybe even further away to Clisson, and you will obviously have the national level too…

The didactical problem or task is to induce the pupils develop a critical distance. This is to be achieved or at least supported by the help of an adult

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talking in the classroom about the geographical issue. The students themselves have to clarify the different scales of the project which leads them to add another dimension to the geographical issue (by cutting of the space and drawing of limits) by comparing the stakeholders' scale with that of the users (an issue first sketched by comparing the different means of transportation, see section 4.1). Therefore, the students hesitate between just listening to the mayor and preparing questions before the meeting.

485	C	But the mayor, what is he doing, is he explaining the project or... say well he has...
486	D	Well he answers questions

The way the students anticipate the meeting focuses on how to understand where the mayor and his speech are positioned in the project.

They follow up believing that the pupils cannot assess this kind of speech unless they have previously worked on the project itself, in which the mayor would be included:

515	B	I don't know, otherwise we could link to... link the interview with the mayor to the scenarios of development, you know what we said we
516	A	Ah, yeah, no. No, no, but yes, that's true it can be cool
517	B	Well, in fact, a talk about...
518	C	About the future of the township
519	B	About the impact of the tram line
520	C	Ok, but then
521	B	But the meeting with the mayor comes later indeed
522	C	What about the decision-making process?
523	B	What?
524	A	Do we leave the decision-making process aside?
525	D	We don't but we do otherwise

What has changed here is how they deal with knowledge as a statement (the decision-making organisation chart, the organisation of the urban area). The prospective work (constructing possible scenarios of town and country planning after the tram line has been built) plays an intermediary part between the mayor and the pupils. And this go-between should structure the meeting, or at least the analysis of the mayor's speech[13].

The first two lessons allowed the students to study the project theoretically, challenging the one-way technical solution (tram line is good to fight pollution). This new perspective on the project leads them to consider several other solutions by stretching the initial problem: they know that the tram line could only be a way to move the traffic problem to another place in the urban area, and that it does not deal with the problem of job-housing distances. These various

[13] One of the other groups plans to record the interview in order to work on it later.

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possible answers and the need for a critical approach (skills to be trained) help them to understand the personal interests behind any answer. This is what they do by localising the viewpoints of both the pupils and the mayor in the city's operations. Therefore, these viewpoints are related to data and speeches (stand takings): the mayor would promote what would help bring his city closer to the next major city, focusing on the trip duration; the pupils would talk about the impact of the increased traffic around the school or on their daily trip to school, focusing on the size of the parking lots planned. Only through a global understanding of the operation of the entire urban area are we able to compare those two ways of relating data to the perspectives of the speakers.

Through their shifts in reasoning, we have observed that the students alternatively deal with epistemic issues (knowing the circumstance) and epistemological issues (comparing opinions by focusing on how they deal with reality); which potentially leads up to a more general statement. The students are managing both logical as well as practical issues.

The lesson they plan for the pupils makes the geographical problem-building a necessary condition to discuss with the mayor in order to develop citizen skills. The geographical anticipation of the situation after the tram line has been built puts them at a distance from the project, namely from the specific interests of one side (pupils, their families) and the other (stakeholders):

537	C	Acting as a citizen…
538	A	Acting as a citizen means asking him if he has anticipated the... an extension of the school, you know, if the population grows
539	B	So this still is in relation to the mayor
540	A	It is, yes
541	B	So this will be done with the scenarios?
542	A	The prospective scenarios, yes.
543	B	The scenarios we will have built together
544	A	Isn't that acting as a citizen to ask oneself, well..., what will become of us?
545	C	Well, of course
546	B	Absolutely.
547	A	Before acting on the world, you act on your own vision of the world.

Acting does not only refer to action as moving[14] (going out of school, talking to real people and not only teachers...), but also to science in action (Latour 1987) which gives you the means to "act on your own vision of the world" (547). At that point the students have abandoned their tendency to separate knowing and acting and the way they link them together has to do with different kinds of problems: to be reshaped the political issue is squeezed between the geographical problem and the didactical problem.

Conclusion

This case study is worthwhile in that it challenges the ordinary way we – at school and in the media – think about relations between social science knowledge and political issues. When confronted with the necessity to have pupils work on both geographical knowledge and political skills, students

[14] See Lahire (2001, 126).

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sometimes feel they have no choice but to find another way than using geographical concepts to answer political questions, since this would prevent pupils from developing the critical skills involved.

As we pointed out earlier, they thus challenge the expert way, which is the prevailing reference for school projects. When implemented in the classroom, such projects give the teacher too much control over the circumstance, which counters the aim to train pupils in making their own choices. Moreover, the students in group 3 realised that it would also prevent pupils from learning how to use geographical concepts as tools (and pupils would continue to view concepts as simple words to learn).

However, scientific debates cannot be considered as an easy pattern that can be imitated in the classroom. What happened in this training course, however, allows us to better understand what is at stake behind the skills to be developed with reference to science practices. "Knowing how to distinguish rational arguments from statements" can be reduced to listening carefully to what the other says; or to understand and respect each other's arguments, but posing fruitful questions implies stronger analytic skills and creativity. When thinking about these implications, our group of students give us a clue towards this second level critical capacity.

The first one deals with the possibility to transfer scientific autonomy, i.e. its ability to detach from the political issue and to reshape it, into the classroom: not to change the classroom into a scientific community, but to simultaneously construct the answers and the conditions in which the answers are worthwhile. From what our case study suggests this problem-based approach could thus be considered for use at the school level (to be adapted from primary school to university).

This can be seen in the way the students deal with the decision-making process: the concept of scale is at first a simple word to describe the hierarchical structure ranging down from the national government to the district and the city. But in the course of the work, students change this use of scale from a simple word into a tool to understand positions and statements of the people involved. Initially, the scale is a way to speak geographically in order to make a description of the issue. Later it becomes an instrument to localise the stakes not only in the urban area, but also in the space of interests. One can talk about the urban area (cartographic scale) to promote specific interests (mobility of employees: social groups scale); and one can talk about a section of the peri-urban area (cartographic scale) to promote general interests of the entire urban area (all inhabitants of the urban area: social scale). This set of scales has only been sketched by the students during the two episodes highlighted in this paper, but it shows how concepts can be re-thought on the occasion of a political problem.

This leads us to suggest that researchers could try and implement new experiments in classrooms. One could focus on reversing the usual projects, starting with a media-type debate among the pupils over a sustainable development issue and then working on the recording of the debate to assess main arguments in a disciplinary (or multi-disciplinary) perspective. Assessing arguments rather than solutions may be part of a new approach in education for sustainable development.

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What Contribution Can the Humanities and Social Sciences Make to Career Guidance in General and Technological *Lycées*? The Case of Economics in Year One of *Lycée* in France

In accordance with the 2008 Resolution of the Council of the European Union on "Better integrating lifelong guidance into lifelong learning strategies", the reform of French *lycées* has included career guidance among its priorities. This reform, which was implemented in 2010, includes lessons on exploring economics for all students in year one (*seconde*) of the French three-year lycée. Will this new feature help to promote career guidance?

This research aims to show that academic and vocational guidance is socially controversial, and that the two programmes on economics, "Sciences économiques et sociales - SES" *(social and economic sciences)* and "Principes fondamentaux de l'économie et de la gestion - PFEG" *(basic principles of economics and management)*, provide knowledge and skills from the humanities and social sciences that are useful for the guidance of year one students, even if the teachers involved do not feel directly involved in assisting with career guidance.

As career guidance is not a discipline, will efficient teachers be those who are able to distinguish between "knowledge that" and "knowledge for"?

En conformité avec une résolution de 2008 du Conseil de l'Union européenne portant sur «Mieux inclure l'orientation tout au long de la vie dans les stratégies d'éducation et de formation tout au long de la vie», la réforme du lycée en France affiche parmi ses priorités l'éducation à l'orientation. Cette réforme mise en œuvre en 2010 comporte entre autres un enseignement d'exploration d'économie pour tous les élèves de seconde. Cette nouveauté va-t-elle contribuer à promouvoir l'éducation à l'orientation?

Cette recherche se propose de montrer que l'orientation scolaire est une question socialement vive, et que les deux enseignements d'économie de seconde, «Sciences économiques et sociales - SES» et «Principes fondamentaux de l'économie et de la gestion - PFEG», apportent des savoirs et compétences issus des sciences humaines et sociales utiles pour l'orientation des élèves de seconde, même si les enseignants impliqués ne s'estiment pas directement concernés par l'aide à l'orientation.

L'éducation à l'orientation n'étant pas une discipline, l'enseignant efficace sera-t-il celui qui saura distinguer «savoir que» et «savoir pour»?

Keywords
Career guidance; teaching economics; social acute questions; French general and technological *lycée*; "education for…".

1 Introduction

According to the Council of the European Union (2008), guidance consists of both providing information and counsels and teaching the skills necessary for decision-making. Lifelong guidance begins in the school. Guidance means educating for citizenship and in decision-making. To some extent this converges

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with the goals of "education for...", in particular with education for sustainable development and education for health. Like sustainable development and health, guidance is not a discipline apart, but it concerns all the students. Vocational and academic guidance is intended to be a subject taught in all the disciplines.

The guidelines of the Council of the European Union are addressed to all Member States. We have limited the scope of this research to the case of France. The ongoing reform of France's lycées started in the year one classes (*seconde*) at the beginning of September 2010, it continued with year two, the "junior" year (*première*), in September 2011, and will reach year three, the final or "senior" year classes (*terminale*), in September 2012.

The objectives of this reform as outlined by Luc Chatel (2009), then Minister of Education, are to ensure the success of every student. To achieve this, the reform targeted three points: for each student, better guidance, better support, better adaptation to the present time. The first of these three points directly invokes guidance, which is to have an orientation that is more progressive, more open, and fairer, the latter two points being of course not unrelated. The lycée reform took a novel form in year one: the students have to choose two exploratory courses lasting an hour-and-a-half per week in order to assist with their future guidance, and one of these must be introductory economics. Lycée economics courses are taught either by teachers of "Sciences économiques et sociales - SES" *(social and economic sciences)* or by teachers of economics and management, who prepare students for, respectively, an economics and social sciences high school diploma (*Économique et social - ES baccalauréat*) or a management science and technology diploma (*Sciences et Technologies de la Gestion - STG baccalauréat*). In year one, these courses can be part of either of two different programmes, "economics and social sciences" (SES) or "Principes fondamentaux de l'économie et de la gestion - PFEG" *(basic principles of economics and management)*.

We have made the hypothesis that the lessons in exploring economics contribute to academic and vocational guidance. Does the differing content of the two programmes have an impact on the way in which the students do, or do not, take on board the guidance?

Our theoretical framework is sociological, and we draw on curriculum theory. The curriculum is socially constructed (Mangez 2008) and results from a process of selecting what is to be transmitted (Forquin 1989). This involves analyzing the gap between the formal curriculum, consisting of knowledge that is to be transmitted to the pupils, and the actual curriculum, as students take it on board in the real-life school situation.

Our research corpus consisted of official guidelines, reports, and interviews conducted in a general and technological lycée. An economics teacher in the SES and PFEG options teaches year one students aged 15-16. As part of a recorded semi-structured interview, we asked the following question: "In the year one lessons on the exploration of economics, what is there about guidance?" The teacher gave us permission to go into the PFEG class and ask the students to complete a questionnaire: "What did you learn in PFEG that can help you with your academic and vocational planning?" The wording suggests that the pupils must have learned something, but they are free to answer that they have not learned anything. We transcribed the interview and, given the small number of students surveyed (29), went through the questionnaire manually. We also interviewed three students at the end of the class without the teacher present.

In the first section we show that, in shifting from a prescriptive approach to an educational approach, academic and vocational guidance has become a

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controversial issue in the humanities and social sciences. In section two, we examine in greater detail the programmes of the two new subject areas, SES and PFEG, to see whether the lessons in exploring economics enable the year one teachers to address topics that are directly related to guidance. We conclude with a discussion.

2 Guidance in the School Framework

2.1 Career Guidance: From a Prescriptive Approach to an Educational Approach

2.1.1 A New Definition

As was noted by Huteau (1999), the history of guidance is the result of several interacting histories: economic and social history, the history of education, the history of psychology, and the history of ideas and practices. The definition of guidance has also evolved over time; here we propose two.

The first legal definition of guidance in France was set out in Article 1 of the Decree of 26 September 1922, but repealed in 2006: "All the operations devolving to the Deputy Secretary of State for Vocational Education prior to the placement of young men and women the in trade and industry and which are designed to establish their physical, moral and intellectual aptitudes" (Danvers 1988, 7). Career guidance at that time concerned only students of vocational education. Indeed, until the early twentieth century, the question of guidance did not even arise, as positions were fixed at birth, the son generally taking up the trade of his father. The need for reconstruction after the First World War along with technical progress made it necessary, in the words of Charles F. Taylor, to place the right man in the right place, which was the justification for guidance in the form of psychometric testing.

The 2905th session of the EU Council (2008) on Education, Youth and Culture defined guidance as "a continuous process that enables citizens at any age and at any point in their lives to identify their capacities, competences and interests, to make educational, training and occupational decisions to manage their individual life paths in learning, work and other settings in which those capacities and competences are learned and/or used. Guidance covers a range of individual and collective activities relating to information-giving, counselling, competence assessment, support and the teaching of decision-making and career management skills."

The 2008 Resolution stresses people's responsibility with regard to their guidance throughout their lives. The school is thus the first concerned. The point is to move from a prescriptive approach to an educational approach to academic guidance. In the prescriptive approach, the adult is responsible and is the one who directs, and the students do what they are told. In the educational approach, the students are responsible and are the ones who direct themselves, and the role of the adult is to help students develop skills that enable them to make their own choices.

2.1.2 The Student at the Heart of Academic Guidance

Every student needs to receive information and advice to find the studies and the profession where they can flourish. The Law of 10 July 1989 on guidance introduced the right to guidance counselling, and Article L313-1 of the

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Education Code states: "the right to guidance counselling ... is part of the right to an education".

Circular No. 96-230 dated 1 October 1996, published in the *Bulletin Officiel* No. 36 of 10 October 1996, introduced career guidance into lycées. The Circular states right from the introduction that decisions about guidance must remain the personal responsibility of the student. Having a good basis for this choice demands in-depth education and information. The general and technological lycées therefore need to carry out a vigorous policy on guidance counselling and information on courses and careers. Upon completing lycée, the students must be able to make their decisions in full awareness of the requirements of higher education and the related opportunities. During the three years of lycée, career guidance should enable the gradual formation of a hierarchy of choices. This may be done by enriching the skills already acquired in *collège*, or middle school, in preparation for career activities and the social and economic environment by providing information about the characteristics of the different types of *baccalauréat* diplomas and the related training pathways, while striving to challenge stereotypical representations and helping to develop a positive and realistic self-image.

Academic guidance primarily concerns head teachers, guidance counsellors, psychologists, librarians, and senior education advisors, but also involves the other members of the educational team. Choices about guidance are crucial for the students and their families, which leads us to consider guidance as a lively and controversial issue.

2.2 Guidance: A Controversial Issue for the Humanities and Social Sciences

Legardez (2006) defines a social acute question ("*une question socialement vive*") as one that is controversial in three domains: in society, in the reference knowledge, and at school. Here we show how guidance is controversial in society at large, in academic knowledge in the humanities and social sciences, and in education.

2.2.1 Guidance is Controversial in Society

In the field of guidance, individual issues take precedence over collective issues (Henoque, Legrand 2004; Solaux 2005). Collective issues are reflected in the practices of selection and distribution; the point is to optimize the management of flows so as to adapt the students to the number of positions in various institutions and to the opportunities available in the economic environment. Individual issues are reflected in each person's desire to succeed in life.

Due to the rising strength of the values of individualism and consumerism, families want the power to make decisions about their children's guidance (Humann 2009; Richit 2010). Parents, especially from the managerial class, no longer grant recognition to the expertise of the teachers and school teams. They overwhelmingly prefer general education pathways and do not hesitate to challenge the decisions of academic counsellors and head teachers, or even the appeals process[1]. If a final decision is not to their liking, they prefer their

[1] In France, the last teachers conference of the year uses to decide the next class for each student on the basis of parents' wishes. This teacher conference is composed of all the teachers of the class and presided by the head teacher. At the end of year one, the next class may be year two with a specified pathway, or year one again. If parents disagree, they have a discussion with the head

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children to repeat. Parents also want to be able to choose which school their child attends, and do not hesitate to put the different institutions in competition, including with private schools, and they challenge the school districting. Finally, there is social pressure on the part of all families to extend education, with level "bac+3" becoming the norm. This corresponds to a "*licence*", level L in the European LMD system. Parents believe this will protect their child from unemployment.

The state is primarily concerned with managing flows in order to find a position for each student and to fill training in an optimal fashion. It must make trade-offs between the costs of education and social justice. These are political decisions. The media debate poses supporters of an interventionist state against free market proponents who are advocating more power for users. The values of equality and freedom compete. Today, the focus is not so much the problem of a society that works for the common good as that of the individual and the family. In *Le Monde diplomatique*, Christian Laval (2011), a sociologist, argued that, "it is important to understand finally that we have entered an unprecedented age of the institution: that of the new capitalist school."

2.2.2 Guidance is a Controversial Issue in the Academic Knowledge

There is ongoing debate in academia about the reality of equal opportunity. In the fields of the humanities and social sciences, we have chosen to highlight economics and sociology.

In economics, education is an investment. The theory of human capital, proposed in 1964 by Gray S. Becker, assumes that individuals can improve their productivity by voluntary acts of investment in education and training. The possession of a diploma does indeed reduce the risk of unemployment. In addition, people's salaries tend to vary directly with the level of their diploma. Wage differences reflect the fact that individuals are not all willing to make identical investments in training. For Duru-Bellat (2006), this investment does not always pay. She shows that while the race does usually pay off for those who take part in it, it is wasteful for society as a whole: diploma inflation tends to reduce their value. For their part, poorer families often have to make a cost-benefit calculation. Boudon (1973) showed that the continuation of studies depended on the trade-off for families between the costs of schooling and the expected benefits in terms of a more enviable social position. While families of modest means overestimate the cost of continuing studies, affluent families do not tend to consider any path other than higher education for their children. Thus, for a given level of results, children from poorer families are less ambitious and practice self-selection, which is endorsed by the teachers conference (*conseil de classe*).

In sociology, Bourdieu and Passeron (1964) employ the theory of cultural capital to show that the school honours the culture of privileged strata, and thus functions as a machine for social selection. While the vast majority of children with high cultural capital have access to university, the children of the working classes are selected out. The massification of secondary education is not synonymous with democracy (Merle 2002). Unlike low-income families, families with high cultural capital are "in the know", and understand how to make the right choices in terms of options and establishments (Duru-Bellat, Perretier

teacher, and if they are not satisfied they can appeal. In this case, they are heard by a commission composed of external teachers and head teachers, which definitively rules. If the student is accepted in a not-enough renowned pathway, some parents prefer their child to repeat

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2007). Landrier and Nakhili (2010) demonstrated that, given comparable grades, students from different social origins do not access the same channels. For example, the STT stream (now STG) is a refuge for girls from disadvantaged backgrounds who are lagging behind (Defresne, Rosenwald 2004).

2.2.3 Guidance is Controversial in Education

Students are directly confronted with choices about guidance, with teachers often feeling helpless to address a type of question that is unrelated to their reference pedagogical model.

On the one hand, there is a large gap between the intentions set out by the government to ensure positive guidance and on the other the practical reality of guidance by failure. As part of her research on STG students, Richit (2010) showed that they suffer from a poor image of their stream, which is a far cry from the official portrayal of streams with equal dignity. At the end of the teacher-parent conferences following the last quarter of year one, the students have a sense of injustice, because they feel that more account is taken of their grades than of their work or their projects. From this perspective, guidance is subjective, as is attested by docimology (Dequiré 2008). This is also the result of unequal resources in the family and social environment: poor families are more likely to trust the teachers, whereas more privileged families do not hesitate to do whatever it takes vis-à-vis the head teacher and the appeals board to force a pass. In this case, the teachers feel disavowed.

On the other hand, the *Bulletin officiel spécial* no. 1 of 4 February 2010 on the lycée reform states that better guidance is one of the reform's key priorities. Thus, guidance aims to give every young person the tools, skills and methodology they need to enable them to manage the learning process and steadily to assume responsibility for projects that will make them full citizens. The insistence on career guidance applies to all disciplines.

In our opinion, the teaching of the humanities and social sciences can be a way to awaken students' interest by making them aware of what is involved in guidance. We take the example of year one economics.

3 Education in Exploring Economics and Career Guidance

Career guidance at the lycée aims to provide information about academic and university education, as well as different professions. This can be done through a course in exploring economics.

3.1 The Knowledge to be Taught: The Formal Curriculum

Like the other exploratory courses created in 2010, lessons in year one economics contribute to career guidance. They concern the humanities and social sciences more specifically and, while each retains its specificity, contribute to the overall objective of training citizens and promoting decision-making.

3.1.1 Education in Exploring Economics: Generic Elements

The exploratory courses shed light on higher education and the opportunities it provides by enabling the students to project themselves into the medium- and long-term future. We chose to study more specifically the two new exploratory courses in year one that aim to provide an introduction to economics, i.e. SES

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and PFEG. Both programmes were published in the *Bulletin officiel spécial* no. 4 of 29 April 2010. Each of them consists of four pages, with one page presenting the programme objectives and three pages on the content, with the themes, concepts and additional information set out in three columns.

In making a comparative analysis of these two preambles, we find that both insist on two points. Firstly, these lessons are designed to give all students the basic elements of an economic culture essential for the formation of the citizen. Secondly, they are intended to facilitate an informed choice about pursuing an education in high school and higher education. The official texts thus provide confirmation that economics is useful knowledge for citizens, which helps with choices on guidance, whether the year one SES option or the PFEG option. On the other hand, specific elements are set out.

3.1.2 Education in Exploring Economics: Specific Elements

The specific elements concern the content, the possible choices of study, and the methods recommended.

Regarding the content, SES aims to open the horizons of high school students to two new disciplines, economics and sociology, while PFEG aims to highlight the specific role of particular human collectives represented by organizations, and in particular the company in the economy, and it targets the fields of economics and management.

Regarding the choice of possible studies in higher education, the SES programme relates "mainly to studies in Economics and Management, Law, Humanities and the Social Sciences, the Institute of Political Studies, and preparatory courses for the *grandes écoles* in business and social studies. These studies lead to many different management positions both in public service and in the private sector." The PFEG programme states that it potentially leads to various higher education programmes, including "the *licence*, *grande école* preparatory classes, DUT degree, BTS diploma in the fields of the humanities and social sciences and especially in economics, law or management". The DUT (*Diplôme universitaire de technologie*), a university diploma in technology, and the BTS *(Brevet de technicien supérieur)*, a higher technical certificate, are diplomas that lead to further education lasting two years after the lycée final exam (*baccalauréat*), based on selective access. To this end, the SES programme aims to help students acquire some core concepts and logic in economics and sociology, while the PFEG goal is to enable them to construct accurate representations with a view to a rational informed choice about further study in the lycée and higher education in the fields of the humanities and social sciences.

With regard to teaching methods, PFEG favours the OAC method (observe, analyse, conceptualize): the observation phase is based on the environment of the students and their knowledge of current affairs; the analysis must help bring out the meaning so as to arrive at an understanding of the phenomenon being studied and to be able to conceptualize it. In SES, the point is to take a research approach to initial data and to formulate explanatory hypotheses to give meaning to what is learned.

The programmes are presented in the form of a list of themes, which are different in SES and PFEG[2]. The themes that could provide the teacher an

[2] Bulletin officiel spécial n° 4, april 29, 2010 presents new curricula with objectives, themes of

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opportunity to enable the students to reflect about guidance are, in our opinion, as follows: in SES, theme 7, "The diploma, a passport to a job?" and, in PFEG, theme 9, "What is the individual's role in a company?" The additional guidelines are as follows for the SES theme: "Using statistical data, we will analyse the relationship between the level and nature of the studies pursued and access to jobs with a higher or lower skills level. We will show that the pursuit of higher education is an investment in human capital, but that it is also influenced by the social environment." This theme can help to address the issues of guidance from both an economic and social perspective.

With regard to the themes to be dealt with in PFEG, the additional guidelines specify: "The importance of the human factor in the company will be discussed based on examples from the students' immediate environment, highlighting the different dimensions of human resource management (recruitment, training, promotion, compensation) and showing how human skills can be a source of advantages for the company relative to its competitors. We identify issues involved in job evaluation and the different dimensions of earnings (variability, collective bargaining, employee incentives, etc.). The influence of labour law on a company's activity will be highlighted through a few simple examples." This theme can offer an opportunity to provide knowledge about different professions and to address the human skills required by business. For example, discovering a company during a real or virtual visit can raise awareness about skills and career paths.

3.2 The Knowledge Taught: The Real Curriculum

Our hypothesis is that the exploratory lessons in economics are conducive to career guidance. We offer two views on the implementation of the reform, which began in September 2010: that of the general inspectorate after a mission, and that of a year one class.

3.2.1 The Report of the Inspection Générale

The general inspectorate for national education produced a report (2011) based on a survey monitoring the reform of the general and technological lycées, which was conducted from November 2010 to January 2011 in a number of lycées from different French school administrative areas. Point 1 of the report is entitled: "Promoting progressive guidance, helping to discover new disciplines: the role of exploratory courses".

> "Teachers often offer a lecture that mainly focuses on concepts, without always having the possibility to use ICT and to provide a more attractive dimension to the education provided. The reaction of the students is positive when the teachers address economic points about situations rooted in the classroom environment and they seek to involve the students in a project approach of discovering the economic features of topical situations or themes. The exploratory course takes on its full meaning by giving students access to economic knowledge and to an

exploration and associated questions, notions to discover and additional instructions for the use of teachers.
SES curriculum :
http://media.education.gouv.fr/file/special_4/73/5/sciences_economiques_sociales_143735.pdf
PFEG curriculum :
http://media.education.gouv.fr/file/special_4/73/7/economie_gestion_143737.pdf

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understanding of their environment." (p.13)

The survey therefore concludes that the 2010 reform has not been understood by many SES teachers, who persist in thinking that the exploratory course is a prerequisite for access to the year two ES course. This was the case with the old pre-requisite course, but is no longer true. As for the pedagogical methods, the project approach is more conducive to career guidance. This approach is generally preferred by the PFEG teachers, who also prefer to take into account the student's local environment.

3.2.2 The Viewpoint of a Year One Class

In accordance with official guidelines, the lycée we visited offers its students a choice between SES and PFEG. We interviewed a teacher of economics and management who teaches SES and PFEG, and then the students from one of her PFEG classes.

For the teacher, the option of economics in year one provides knowledge that will enable students to decide whether they like economics and whether they are comfortable with this material. It helps them to discover the world around them. With respect to guidance, she sees this in the SES programme only in the "diplomas and employment" section, but this is more in relation to "the more degrees you have, the greater the chances of getting a job", and not really about guidance. In PFEG, she highlighted the section on the role of the individual in the company.

> "But that's guidance in a very general sense; we talk about professions, but we don't talk about their own career plans, their own skills, and their own wishes. Guidance for me is something individualized, it's hard for me to see how you could talk about it in general terms. We talk about wages, compensation, the job contract, but they don't all want to be employees in a business... This may give them some ideas, of course; when we presented the company I made them do some searching about '*auto-entrepreneurs*', this could inspire some desire. But for me this is not help with guidance... Assisting with guidance, this is hard to do as part of a course... I have a little trouble in being both a guidance counsellor and a member of the teaching profession. I was trained to convey knowledge and not to give advice, so I have a little trouble, I am not aware of all the training... and then I do not have time... For me, these are two totally different professions... There are guidance counsellors. I expected to teach economics, law... Somehow it bothers me, it's not my job, I'm not trained for that, I could talk nonsense. This makes us do things that are not within our competence. Just because you're a teacher of economics and management doesn't mean that you know every profession; I know the profession of teacher, that's all."

The students feel they learned a lot about guidance in the PFEG course. They stressed the importance of knowledge of new subjects, and particularly specific knowledge about economics and management. They believe they have learned about different career orientations and different professions and paths to follow, and the course is sometimes seen as helping with decision-making:

> "With an ES BAC you can do a lot of things. PFEG helps us a lot to understand the world today." (girl)
>
> "I learned how a company works, which will help in my planning, whether or not I want to work in a company later." (girl)
>
> "I like PFEG, it's a subject that helped me to be sure about choosing my study stream, which is year two ES." (girl)

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> "This helps us to decide whether or not we are more destined to go into the ES or S (i.e.scientific) stream." (boy)

In the interview that followed, during which three student volunteers were asked to explain their views, Laura talked about the contents of the option, which will be of help to her later:

> "I have learned many things that push me even more in the direction I wanted, because I wanted to go into S, to become... to work for myself... to become a veterinarian.... It taught me about managing a company, everything that the boss has to do, a lot of technical terms that help me... I think it will help me for what I want to do next, as a veterinarian, as someone who's self-employed."

Laura is aware of the value of managerial disciplines for someone who wants to set up on their own, as a self-employed professional or an entrepreneur.

Manouba told us of her pleasure in attending the PFEG course – discovering a subject that she finds interesting makes her want to go into STG:

> "I have learned in PFEG that it makes me want to go to STG, because we talk about business, companies, it really shows things, so it gives you desire."

The year one students seem clueless about the choices they will need to make, and some will make them a bit at random. Sonia told us that she was indecisive:

> "Actually I wanted to become a lawyer... since I was little... but later I told myself ... the teachers told me it's useless because I'm not good enough... some say yes, some say no... so later I said I'll go into STG because I like it a lot and we'll see what I will do later ..."

These views are not representative, as they reflect only one class in a lycée, but they nevertheless allow us to point out some issues that can be submitted for discussion.

4 Discussion

4.1 Teaching Economics – In Closer Connection to Sociology or to Management?

Lycée teachers in France are hired through a competitive process centred on economics and the social sciences (*sciences économiques et sociales*) for SES teachers and on economics and management (*économie et gestion - EG*) for PFEG teachers. In addition to economics, SES teachers need initial training in sociology, and PFEG teachers in management. SES courses in France have greater academic legitimacy than EG courses (Legardez, Valente 2009), while they still explicitly retain the goal of training in a critical approach. SES teachers, most of whom have a university education in economics, are often sceptical of the world of business, and consider that, in the new capitalist school, guidance tends to take precedence over teaching and the transmission of knowledge: the school might seek less to transmit culture and knowledge that is worthwhile for its own sake than to produce individuals who are suited to being incorporated into the economic machine (Laval et al. 2011). Teachers who teach economics and management in PFEG often themselves have corporate experience. As the company is an educational subject for them, they may perform internships and

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meet with the company heads. They generally have a positive view of the company and see it as a source of jobs.

The teaching of economics in PFEG is more focused on management and the company than is SES. While in SES themes related to guidance are problematized ("Risks of dropping out of the labour market?"), in PFEG they usually concern career information and workplace relationships. The objectives of guidance could be achieved by each of the two courses: SES by offering a more comprehensive vision, and PFEG a more targeted vision, closer to the pupil's daily experience. As for pedagogical methods, SES emphasises a collective approach to class management in the form of an interactive lecture, using a few documents, whereas PFEG tends to focus on group projects (for example, some classes take part in a competition where the students come up with a proposal for a small company). The opinion of the *Inspection générale* is that this latter method is better for the students. The teacher we met also had the students do research on the Internet ("I made them do some searching about '*auto-entrepreneurs'*"). This does not preclude education in choice; for example, the teacher we met planned to have her students develop a dossier on a range of occupations in a field chosen by them, which could be the voluntary sector or public sector or an enterprise. The dossier could be the product of small groups, thus socializing the research process, or of the individual, and thus involving a more personal relationship with the teacher. The main limitation of this type of approach concerns staffing levels: it is difficult to handle an IT course with 35 students each working on their own project. Another limitation is the representation that the teacher has of the discipline.

4. 2 Teaching Economics: For Knowledge Transmission or for Skills Acquisition?

We believe that the teacher tended to emphasize knowledge (academic knowledge for SES, practical knowledge for EG) and to resist the requirement to introduce skills. For example, in the lycée in question, the economics teachers are continuing to give grades in year one, whereas the exploratory courses must be evaluated based on skills. In France, grades are usually based on tests, whereas a skills-based evaluation requires that the teacher ticks a box, "acquired" or "not acquired", on a list of specific items to be evaluated in the course, with each item representing a skill. Economics professors want to give grades, as they believe that this is a good way of motivating the students to listen and work. However, language professors manage to give grades based on five skills, using the European reference framework for languages, by setting up flexible skills groups, even though this calls into question the perennial schooling form and creates major problems for the schedule.

Unlike her students who feel they have learned a great deal in the PFEG option regarding their guidance, both in terms of the contents of the subjects taught in certain streams and the different professions in companies, the teacher was dissatisfied. When asked, "In the year one lessons on exploring economics, what is there about career guidance?", she wanted to answer "Nothing". How can this difference in perception be explained? By dealing with the programme content and by answering the students' questions, the teacher discussed themes that could help the students. The teacher's main activity regarding this theme consists of contributing knowledge in the fields of economics and management, as well as providing information about the different year two streams, and particularly the STG stream (management science and technology). The teacher did not feel equipped to counsel the students about their future or about the

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best courses to take to prepare for it, she took a long-term approach. The students, on the other hand, felt that they had received good guidance when the information they were given enabled them to choose their next year's class, and thus took a short-term approach. The teacher represents guidance simply as individual counselling. For her, guidance is outside her field, and is the province of the professionals, psychologists, and guidance counsellors, who are trained for this.

Teachers often have a representation of their role as a transmitter of legitimate knowledge. For them, only their own discipline is legitimate, they are specialists in it. They possess a discipline-based awareness (Reuter 2007) and are sceptical about "education for" and "cross-disciplinary skills" (Rey 1996). They want to teach, to educate in a rigorous way, but they cannot train, whereas the circular of 23 May 1997 defines the mission of a teacher working in a collège or a general, technical or technological lycée as follows:

> "The teacher's mission is both to educate the young people entrusted to them and to contribute to their education and train them with a view to their social and professional integration. He or she ensures that they gain knowledge and expertise, in accordance with the levels set by the diploma programmes and qualifications, and supports the development of their skills and abilities. The teacher helps them to develop critical thinking skills, to build their autonomy and to develop a personal project."

It is therefore important for teachers to help students develop career management skills. These skills are interdisciplinary, and include initiative, autonomy, and argumentation. The teacher did not report that the PFEG work methodology could help students to develop skills within the social sciences that might be useful, for example, to search for, process and analyse information, or for working in teams. She doesn't believe that her lessons in communications and her professional experience have equipped her with the skills in psychology that would enable her to help her students to find the training and jobs that suit them best.

There is reason to regret the vague side to the curriculum for education in guidance, as for other "educations for". Teacher training in different social sciences is important for the teacher to be able to carry out career guidance.

Conclusion

Career planning requires identifying reference points, making informed choices, steadily building one's own pathway for learning and employability, and learning to become independent and lucid in one's decision-making. The two exploratory economics courses enable year one teachers to discuss with their students themes that are directly related to guidance, for example, in sociology, the theory of reproduction and the social practices of guidance and selection, and in management, knowledge about the professions and the skills that they require, by challenging stereotypes (SES) or by helping to construct a better self-image (PFEG). Education in guidance, like other "educations for" (Pagoni 2009), requires calling into question the form of schooling and the training of teachers in both knowledge and skills.

The courses exploring economics are thus potentially conducive to career guidance. In our opinion, more than just the option SES or PFEG per se, it is the teacher's familiarity with the "educations for..." that makes for effectiveness, by distinguishing "knowledge that" from "knowledge for".

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What Kind of Critical University Education for Sustainable Development? A Comparative Study of European Students and Social Representations

In the course of the institutional integration of education for sustainable development (ESD), university courses have been going through rapid changes, but this process can be blocked or aided by each country's peculiar features, whether institutional, financial, cultural or other. This article proposes an examination of the specific socio-educational characteristics of the implementation of ESD based on a study of the social representations of students in three European countries (Germany, France and Poland), and in two types of Master's level university education. The paper initially focuses on the differences and similarities in the student research groups. It then analyses the representational components in terms of the possible impacts on the implementation of ESD at the university from a critical, citizenship perspective. Despite the differences in the students' representational structures in the various countries, we can see that, in the three national groups, the social representations of sustainable development are highly focused and have a highly fragmented character. The lack of systematization of the different elements of the representation poses barriers to critical education, although this takes different forms in the different countries.

Keywords
Education for sustainable development, Critical education, Social representations, University, France, Germany, Poland

1 Introduction

The incorporation of education for sustainable development (ESD) into contemporary education systems represents a response to the United Nation's programme for sustainable development (Sauvé 2006). The United Nations Educational, Scientific and Cultural Organization (UNESCO), acting as an implementing agency of the UN, is holding a "decade of education for sustainable development" (2005-2014), with the objective of stimulating the reform of educational systems and curricula, including universities, to promote sustainable development (UNESCO 2005). Taken up by the European authorities, and then the member States, this has led to steadily increasing demands on universities. It is commonly agreed that higher education institutions should lead the way towards the achievement of sustainable development (SD) through education in this field (Adomßent, Godemann, Michelsen 2007; Ashford 2004; Beringer, Adomßent, Scott 2008; Ferrer-Balas, Adachi, Banas, Davidson, Hoshikoshi, Mishra, Motodoa, Onga, Ostwald 2008; Richter, Schumacher 2011; Steiner, Posch 2006; Sterling, Scott 2008).

In this sense, the Declaration of Talloires (1990) is the first official mark of the universities' commitment to promote education for sustainable development. Signed by 350 universities, it is intended, among other things, "to create an institutional culture of sustainability" (Declaration of Talloires, 1), and to emphasize education that leads to "ecologically responsible citizens" (ibid.). At the national level, there is a realization of international and European policy. For

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example, since September 2009, higher education institutions in France have been developing a "Green Plan" for the campuses. In Germany, the education system depends on the Länder (states), which makes the development of a national strategy more complex. Nevertheless, a common will does exist, as can be seen in the Declaration of the Hochschulrektorenkonferenz (HRK, the German Rectors' Conference[1]). In Poland, there is no specific national strategy for Higher Education for Sustainable Development (HSED). The National Strategy for Environmental Education through Education for Sustainable Development (2001) and the National Conference on Education for Sustainable Development in 2005 have laid the groundwork for the organization of ESD and HESD.

In this context of the institutional integration of education for sustainable development, university courses are undergoing rapid changes (Adomßent, Godemann, Michelsen 2007; Barthes, Alpe, Bader 2012), but they encounter drivers or barriers in the existence of features specific to each country (institutional, financial, cultural, etc.). Wals and Blewitt (2010) provide an interesting analysis of the implementation of sustainable development in higher education and conclude that institutions are entering a "third wave" (after the "environmental" wave and the "green campus" wave) that is focused on teaching and learning about sustainability. However, uncertainties in scientific fields (Pouliot, Bader, Therriault 2010), the multitude of definitions in reference materials (politicians, experts, scientists, etc.) (Alpe, Legardez 2011; Simonneaux 2011), the different regional and organizational cultures of the actors and institutions involved all affect the implementation of educational strategies related to sustainable development (Girault, Sauvé 2008). At the same time, beliefs, convictions and social representations with deep cultural roots also affect the ways that educational strategies related to sustainable development, considered as a socially acute question (Legardez, Simonneaux 2011), are being implemented in different places (Floro 2011; Freudiger 2010; Marquis 2001; Simonneaux, Simonneaux 2009). With all this in mind, this article proposes, firstly, to understand the specific features of the implementation of ESD in three European countries – Germany, France and Poland – based on the social representations (Abric 2004; Jodelet 1989) of students studying for a Master's of European Studies or a Master's in Geography with a Globalization-Development option. The representational components will then be analysed in terms of their possible impacts on the implementation of education for sustainable development from a critical perspective. According to Jodelet (1989) a social representation is defined as a form of knowledge, which is socially elaborated and shared and which contributes to the construction of a common reality to a social group.

2. Social Representations as a Method for Exploring Cultural Specificities with Respect to ESD

2.1 Background

Like all "educations for", ESD is confronted with the problem of defining its content, a process that has been accompanied by some rather lively debate (Alpe, Legardez 2011; Simonneaux 2011). Generally, these forms of education refer to knowledge that is relatively unstable and marked by uncertainty. Moreover, it often involves the translation of "social concerns that are more or

[1] http://www.hrk.de/index_eng.php

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less considered as emergencies" (Audigier 2005, 117), with academic knowledge no longer the sole reference for dealing with these new educational subjects. The "educations for" are concerned with citizenship; they refer to social practices and include political dimensions (Audigier 2005). But the introduction into the education system of issues like these that divide and mobilize is not simple. Tutiaux-Guillon (2011) stresses that ESD, which goes beyond disciplinary knowledge and involves education in behaviour and skills (citizenship), is – in the real curriculum – most of the time reduced to education in "good gestures" (Barthes, Bader, Alpe 2012), whereas it could promote the empowerment of learners who are able to think and to come to a position on issues.

Many researchers in the field of environmental education and more recently ESD have supported the need for critical education that aims to help learners develop an awareness of the power games and ideological influences that shape our ways of seeing the world and our relationship to the environment, so as to encourage critical questioning of our society aimed at social change (Bader 2011; Fien 1993; Fortin-Debart, Girault 2009; Girault, Sauvé 2008; Gough 1997; Robottom, Hart 1993). From this perspective, Bader (2011) argues for the importance of a critical and reflexive view of the utilitarian ideology that dominates our relationship to the world. The author points out that critical theory "denounces in particular the recourse to instrumental rationality that relies on a certain conception of science, enclosed in a positivist paradigm, and that focuses on technology as the source of any solution [to environmental problems]" (Bader 2005, 109, quoting Sauvé 1997, 171). Along the same lines, following Carr and Kemnis (1986), Simonneaux and Legardez (2011) take up the distinction between critical and technical rationality; the latter emphasizes technical solutions to problems and excludes individual reflection to control the world, even though it is essential for an awareness of reality and engagement in action for social transformation. According to Simonneaux (2006), critical ESD should thus encourage students to learn the scientific contents at hand, to better understand the controversies about them and to analyse their social impact (economic, political, ethical, etc.). The author stresses that this is not just to convey technical knowledge, but to educate "people who are informed about research methods, their applications and their possible effects, and who are able to make balanced decisions and participate in debate" (Simonneaux 2006, 40).

Critical education also relates to the idea of citizenship, which involves the concept of citizen participation in decision-making. If we take the scale of analysis used by Fortin-Débart and Girault (2009), this is measured by three states of participation: non-participation, consultative participation, and participatory budgeting. It can have two aims: a deliberative aim (citizens fuel the decision-making process because they are trained in the controversies), or an emancipatory aim in a critical perspective (Robottom, Hart 1993), which involves civic participation in the decision-making process. While the deliberative aim remains at the level of consultation, it is the emancipatory orientation, with its objective of transforming environmental and societal realities that aims at genuine participation. Citing Robottom and Hart (1993), Fortin-Debart and Girault (2009) again point out that this critical questioning of reality and this commitment to action are more effective when they are collective rather than just individual. From this citizen-based perspective, critical education would then be "education in power (Audigier 2006) that aims at providing the skills to participate in the life of the city (public life, politics, everyday life)" (Fortin-Debart, Girault 2009, 131), knowing that participatory ESD runs the risk of

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repeating dominant positions and hegemonies, like mentioned by Læssøe (2008).

It is in this educational perspective that we situate our analysis of the social representations of sustainable development in. Indeed, considering knowledge as a social construction, critical education requires prior identification of learners' representations about the subject of the education so as to propose didactic strategies that take this into account (Bader 2011; Gough 1997).

Sustainable development raises socially controversial issues in education (Legardez, Simonneaux 2006, 2011) and evokes social representations that can be used as a tool for understanding student knowledge. By making use of the social constructivist approach (Vygotsky 1997) to education, we highlight the importance of an analysis of social representations as an anchor point for initiating the learning process. This seems especially important since, in contrast to ordinary disciplines, this new material is marked by the heterogeneity of academic references. Even if the past two decades have seen the emergence and establishment of sustainability sciences as an inter- and transdisciplinary field that has provided elaborated accounts of sustainability issues, it seems that there is great heterogeneity of disciplinary knowledge and no universally valid consecutive curriculum (Barthes, Alpe, Bader 2012).

The social representations approach takes into consideration the role of the sociocultural and historical context in the construction and sharing of representations (Abric 1994; Jodelet 1989; Moscovici 1961; Wagner 1994). With regard to our research subject, it can be argued that although there is an institutional definition of SD often used as reference – that of the Brundtland report and the conferences that followed – the subject remains complex and "in practice, the concept of sustainability is value-laden and ultimately rests on how we human beings, or rather societies, perceive our relationship to the extra-human world" (Jickling 1998-1999, 82)[2]. This position is also relevant to the characteristics of 'educations for'. Indeed, these impose a different relationship to scientific knowledge, which can no longer be considered neutral and dissociated from the context in which the knowledge is born (Pouliot, Bader, Therriault 2010; Barthes, Alpe, Bader 2012). Moreover, this is also the reason why there is an important debate about transdisciplinarity in ESD (Steiner, Posch 2006; Considère, Tutiaux-Guillon 2012).

Numerous studies show that social representations related to sustainable development differ with the context, including with respect to the country (Caillaud 2010; Floro 2011; Freudiger 2010; Marquis 2001), the profession or the discipline (Summers, Childs, Corney 2004; Urgelli 2009). In a comparative study between the French and Germans, Caillaud (2010) shows, for example, that environmental issues are more mentioned in Germany. Moreover, whereas among Germans she observes a moral objectification of ecology, which treats the relationship between humans and nature in terms of interdependence, the French consider the relationship between humans and nature only in the sense of the domination of nature by mankind, which causes them to objectify ecology as a set of risks (economic). In another comparison, between Quebec and Senegalese students, Marquis (2001) observed a Quebec representation of the environment as nature to be protected and a problem to be solved, and a Senegalese representation of the environment that was similar to that of their

[2] It is important to note, that the Brundtland definition is located on the very top level of an idea and in the scientific literature, one can observe different normative orientations (see for example Ott's approach to strong sustainability: http://23dd.fr/images/stories/Documents/DD/Strong-sustainability-Konrad-Ott.pdf)

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daily lives, the milieu of their family and community life. In addition, various studies have brought to light a gap between the institutional definition of sustainable development and the related social knowledge (Barthes, Legardez 2011; Jeziorski, Ludwig-Legardez 2011; Lebatteux 2011; Summers, Childs, Corney 2004). Richter and Schumacher (2011) have realized a very interesting study about HESD in the German context. Mainly, they observe a large gap between the political discourse on the one hand and the interest of students in sustainability issues and the implementation of HESD in the standard curricula on the other.

Our study has the aim to complete the research about ESD and HESD by his comparative character and the analysis of students' knowledge in terms of drivers and barriers to the teaching and learning process. It is guided by three key questions:

- Do students have a social representation of sustainable development? If so, what is its content and how is it structured?
- What are the differences and common points between the social representations of French, German and Polish students?
- Finally, do the representational components specific to each national group represent drivers or barriers to the implementation of the critical dimension of ESD?

2.2 Theoretical Elements

The act of representation is traditionally defined as "a presentation of something in someone's mind" (Bonardi, Roussiau 1999), and it is considered a genuine method for understanding reality. It involves a process whereby a subject or a group internalizes an object so that it becomes an object of thought whose content is substituted for reality. The internalized object is thus a represented reality that is appropriated by the individual or group. But this reconstruction by the subject remains inseparable from the history and social and ideological context of the individual or the collective. Moscovici argues that this reconstruction is an intrinsic part of the social bond and that it must be interpreted within this framework (Moscovici 1961). Representation is thus always social in that the act of representation involves incorporating both the objective characteristics of the object represented, the specific features of the subject or the group, and elements from its normative context. Social representations are therefore a powerful tool for analysing the normative systems of a group at a given point, and it is this that interests us as part of the comparative analysis of the national study groups. We apprehend the world through differentiated representations. Contacts between cultures through travel and trade, for example, demonstrate clearly that knowledge that is obvious in one location is not so obvious in another. All reality is "appropriated by the individual or the group, reconstructed in their cognitive systems, and integrated into their system of values, which depends on their history and the surrounding social and ideological context" (Abric 1994, 12).

Studying a social representation and understanding how it works requires studying its content and structure. To this end, Abric (1994) explains that a representation is organized around a central core that gives the representation its meaning and its coherence. Around this structuring core, the cornerstone of the representation, are organized the peripheral elements. The central core, or nucleus, is structural; it constitutes a stable element and takes on for the group or individual the status of being obvious. Its role is thus important insofar as it

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provides the framework for categorizing any new information proposed about the object represented. The core contains a set of hierarchical elements that are particularly important in the representation, as they give it its meaning. The concept of the core is also related to the identification of the individuals in a social group, as the core ensure its homogeneity. The core is thus determined not only by the nature of the object represented, but also by the relationship that the subject or the group has with it, and finally by the system of values and norms that define the ideological context (Abric 1994). It is therefore the identification of the central core that allows the comparative study of the representations.

The peripheral elements are arranged around the central core. The peripheral elements are directly dependent on the context and result from the anchoring of the representation in reality. They help render any new information about a given contextualized situation tangible, understandable and communicable. They prescribe behaviour and guide instantaneous reactions to a specific situation by designating what it is normal to do or say in a given situation.

According to Verges (1992), for example, the social representation of money is structured around the central elements “work” and “quality of life”, ensuring stability. The expressions “ease” and “luxury” are peripheral elements that would reflect individual variations. Thus, social representation can grade terms related to the studied group, and hierarchical structure and explanation hypothesis can emerge.

2.3 Study Group and Research Methodology

In an attempt to answer the questions posed in this study we focused on the quantitative approach introduced by Vergès (1994, 2001), for its reproducibility, which makes possible comparisons (temporal, inter-group, inter-cultural), including with benchmarks. Data were collected using a printed questionnaire. The respondents were asked to answer the questionnaire in their language (French, German and Polish). The analysis was realized in the three languages.

The elements of the central core and the peripheral elements of a possible social representation of sustainable development were collected by activating the representational process through spontaneous evocation by a question: “Which word or which phrases come to mind when you think about sustainable development? Give at least four words or phrases, and at most ten”. To analyse the answers to this question, two working steps were necessary. We first performed a categorization of the items mentioned by respondents based on their lexical proximity. In a second step, two indicators were considered: the frequency with which each term occurred in the responses of the surveyed population, and the order of appearance of the term. Each item discussed (and grouped) results in an average rank and an average frequency. Crossing these two indicators gives us a graphical representation, with the frequency on the ordinate and the ranking on the abscissa. To compose the four quadrants, we need to produce discrete information. For the frequencies we use a method based on main gap, considered as significant for social representation (Abric 1994). For the average rank, we use a classical method based on mean and standard deviation, also related to Abric’s method (the number of words are not the same, so the average rank is always different). This also tells us about the possible existence of the central elements and peripheral elements of the social representation. This analysis can be used to draw up a table that provides a direct reading of the information in four categories: central core, and first,

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second, and third peripheries. Only items mentioned by at least 30% of the respondents entered into the representation linked to Verges Theory (Verges 2001). This analysis was performed using the EVOC2000 programme, but it can be done manually (Figure 1).

Figure 1: Method of reading social representations in terms of frequency and order of appearance (rank)

<table>
<tr><td colspan="4">High frequency</td></tr>
<tr><td rowspan="2">First ranks</td><td>Elements whose frequency is low and which are in the first ranks
Presumption of centrality</td><td>Elements whose frequency is high et which are in the far ranks
First periphery</td><td rowspan="2">Far ranks</td></tr>
<tr><td>Elements whose frequency is high and which are in the first ranks
Second periphery</td><td>Elements whose frequency is low and which are in the far ranks
Third periphery</td></tr>
<tr><td colspan="4">Low frequency</td></tr>
</table>

The survey population consisted of students preparing a Master's degree in European Studies in France, Germany and Poland[3], and students preparing a Master's in Geography in France and Germany. The total population of 157 students breaks down into 22 Polish students, 30 French students and 39 German students in the first grouping, and 44 French and 22 German students in the second. All participants were aged 23 to 27[4].

This article, which is centred on an analysis of German, French and Polish cultural specificities with respect to the social representations of sustainable development among students, presents only a marginal discussion of differences related to the two different Master's degrees (Figure 2).

Figure 2: Survey population (number of surveyed individuals)

	Master in European Studies	Master in Geography	Total
France	30	44	74
Germany	39	22	61
Poland	22	0	22
Total	91	66	157

Here we would like to make two conclusive remarks regarding the characteristics of our national student groups. First, issues of sustainable

[3] It is important to note, that the Brundtland definition is located on the very top level of an idea and in the scientific literature, one can observe different normative orientations (see for example Ott's approach to strong sustainability: http://23dd.fr/images/stories/Documents/DD/Strong-sustainability-Konrad-Ott.pdf)

[4] The Polish and the German students were all born in the respective country. Five of the French students were born in other countries than France, but they lived in France for at least five years.

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development are central to both academic contexts. Second, depending on their respective requirements, the two programmes studied give great importance to the interdisciplinary and critical nature of the education. With this in mind, we submit the hypothesis that both programmes offer a positive framework for the implementation of ESD with a critical perspective.

3 The Social Representations of French, German and Polish Students – Differences and Similarities

3.1 French and Germans: Relatively Common Representations

From a comparative perspective, the analysis of the similarities and differences between the two types of education and the three national study groups reveals relative agreement between the German and French students, as well as between the two different Master's. An examination of the responses thus led to hypothesize the existence of a relatively shared social representation. This appears to be structured primarily around the environmental dimension, in terms of both protection and the use of resources. This environmental dimension, which contains the categories *environment* (with environmental protection) and *energy* (mainly referring to renewable or clean energy, a dimension of eco-efficiency) for the two sub-populations and the category *resources* for the Germans, appears to constitute the central core of any representation. This sphere seems to be especially important given that we find other elements associated with it in the periphery. In both cases the categories *ecology* and *climate change* seem to be relatively close to any such core. Furthermore, the intergenerational dimension is represented by the elements *future generations*, *the future* and *long-term*. These appear in the two sub-populations in the periphery close to the core. The dimension is slightly more developed among the Germans, 67% of whom cite it, compared with 50% of the French. Note that the Germans have a more technocratic vision, with the idea of calling on science and technology as the method of problem-solving. (Figures 3, 4, 5, 6)

Figure 3: French students preparing a Master in European Studies – graphical representation of the frequency and the ranks (100% = 30)

Average rank < 3,2	Frequency %	Average rank > 3 ,2	Frequency %
environment	77		
energy	57		
ecology	37	climate change	40
the future	23	nature	23
economy	20	pollution	10
green	17		10
future generations	13		
long-term	13		
responsibility	13		
development	13		
consumption	13		
regions	10		
other growth	10		
planet and humanity	10		
transport	10		

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Figure 4: French students preparing a Master in Geography – graphical representation of the frequency and the ranks (100% = 44)

Average rank < 3,2	Frequency %	Average rank > 3,2	Frequency %
environment	77		
energy	57		
ecology	56		
nature	39	spatial issues	40
the future	38	agriculture	35
to protect	34	coat and sustainable transport	30
pollution reduction	31		
recycling	30		
danger	25		
responsibility	22		
future generations to consume different	20		
climate problem	20		

Figure 5: German students preparing a Master in European Studies - graphical representation of the frequency and the ranks (100% = 39)

Average rank < 2,9	Frequency %	Average rank > 2,9	Frequency %
environment	49	future generations	31
energy	44		
resources	28		
ecology	18	technology	13
the future	18	development	10
long-term	18	agriculture	8
climate change	15	efficiency	8
education	15	politics	8
		precaution	8
		responsibility	8
		economy	8

Figure 6: German students preparing a Master in Geography - graphical representation of the frequency and the ranks (100% = 22)

Average rank < 2,9	Frequency %	Average rank > 2,9	Frequency %
environment	76		
energy	58		
resources	55		
ecology	39	relationship between men and environments	34
the future	32	sustainable farming	22
future generations	30	back to basics	22
green	30	spatial organization	21
climate change	29		
responsibility	29		
precauntionary principle	28		
sciences and technology	25		
sensitize	22		

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3.2 Very Different Polish Results

The results of an analysis of the responses of the Polish students are very different from those of the Germans and French. First were listed the terms balance and equality, which structure the central core, referring to the inductor term balanced development (the Polish translation of "sustainable development"). No mention is made of eco-efficiency, even though it is present in the core of the French and Germans. The environmental sphere and theoretical concern for future generations appear in 27% and 14% of the occurrences, respectively, but they are not central. The educational dimension appears in the second periphery, while it is not considered as such by the French and Germans. The rich-poor category is among the most cited, but more distant in the ranking. It appears in the first periphery and can be interpreted as a more concrete application of the elements balance and equality. Other terms that are cited less often may also refer to this dimension: development and improvement to achieve balance and equality. The European Union, cited in terms of funding, is associated in the first periphery with the notion of cooperation, which is related to the idea of development. These notions are entirely absent from the social representations of the French and Germans. (Figure 7)

Figure 7: Polish students preparing a Master in European Studies - graphical representation of the frequency and the ranks (100% = 22)

Average rank < 3,1	Frequency %	Average rank > 3,1	Frequency %
balance	41	rich-poor	27
equality	32		
environment	27		
developement	23		
improvement	18	rationality	18
education	18		
the future	14		
cooperation	14		
interdisciplinary	14		
European Union	14		

Based on the analysis of the spontaneous evocations, we can conclude that in terms of the differences in the national study groups, in addition to the environmental aspects on the one hand and the social aspects on the other, the Germans and the French emphasize the dimensions of eco-efficiency and intergenerational effects, while Polish students more often evoke forms of international cooperation for the purpose of sustainable development.

4 Drivers & Barriers to a Critical ESD and Social Representations

Thus, after identifying the elements of a possible social representation of sustainable development of French, German and Polish students, we will discuss the results presented above in terms of being drivers and barriers to the proposed educational perspective.

Addressing the notion of critical education concretely requires a dual approach. The first involves the identification in the social representations of what constitute the foci. The foci are the themes on which knowledge is concentrated, to the detriment of other themes which are thus obscured. Moliner (1996) argues that focusing prevents individuals from having a global vision of

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the object. The second approach involves identifying the elements that make systems. Indeed, when the elements make up systems, the issue of complexity can be addressed. The ability to address complexity is a prerequisite for the formation of a potential critical thinking. Note that the existence of foci often results in a fragmented social representation: not only do they prevent the individual from possessing a global vision of the object, but they also prevent putting the elements of the representation into a system, and hence developing a critical educational perspective.

4.1 Analysis of the Social Representations of SD with a Perspective of Developing a Critical ESD: Main Results

If one analyses the previous elements of the social representations of the German, French and Polish students with a view to establishing a critical ESD, two major tensions can be seen. The first is between the need – from a critical education perspective – to address the complexity of SD and the centring of the students on the environment, and the second is between the need – again from the perspective of critical education – to address the collective organization of society versus the recourse by the students to everyday individual action. The obstacle to critical thinking would tend to be magnified in line with the domination of the second term in these tensions.

4.1.1 What are the Barriers to Dealing with Complexity?

The social representation of sustainable development of the five groups analysed has a highly fragmented character. The foci are very strong and corroborate the results obtained previously in France (Barthes 2011). A focus on the environmental sphere and eco-efficiency, especially among the German and French students, may prevent these students from understanding the complex processes involved. Given these highly focused social representations, it could be said that there is a great risk of a view of sustainable development that does not comprehend its complexity, and thus does not relate to the possible dimension of critical education. Indeed, dealing with sustainable development in a critical education perspective requires consideration of its systemic and multi-scale nature (Tutiaux-Guillon 2011).

Based on the analysis of the foci of the social representations, the absence of political, economic and institutional issues in the central core of the representation, especially among the Germans and French, indicates their fragmented nature, which thwarts an understanding of the complexity of the concepts taught. The *economy* was mentioned by both groups, and *politics* only by the Germans, but both dimensions are part of the peripheral elements, and thus not organizing elements of the representation, whereas they are in fact central components, the result of political consensus (Gough 1997; Jickling 1992; Sauvé, Berryman, Brunelle 2003; Sauvé 2006). While the Germans and French take little account of the role of political and institutional authorities in promoting sustainable development, the Poles seem to be more aware of this dimension, especially when they evoke elements involving *cooperation* and the *European Union* and highlight the active character of international and European organizations. An analysis of the results concerning sustainable development actors confirms this hypothesis: according to the majority of the Poles (73%), global cooperation and the EU aid, introduce, create and make efforts, etc., EU aid is contributing to sustainable development in particular through its

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assistance to poorer countries / regions (47%). In contrast, the Germans and French mainly respond that these two factors do not do enough for sustainable development. Finally, based on the analysis, no group of students is considering a form of political-civic action either in their social lives or in their future professional lives.

Finally, it seems important to note that there is a patent absence of debate and of a sense of the controversial nature of an issue that is as socially contentious as sustainable development, although this characteristic is well established in the reference knowledge and practices. Indeed, sustainable development is more a set of contested ideas than a stable concept (Legardez, Simonneaux 2011; Lundegård, Wickman 2007; Scott, Gough 2004) Thus, the students consider neither the critical dimensions, nor alternative models, nor the element of complexity. Moreover, the focus on the environmental sphere is centred on a very specific representation of the environment. The students' evocations of *resources* and *energy*, of potential candidates for being components of the central core of the social representation of sustainable development, indicate the reduction of the environment to a resource in the service of human beings. A critical approach to education should seek to challenge this utilitarian view, which is at risk of an ideological use of educational discourse to "support a certain view of the world" (Astolfi 2006, 9).

4.1.2. Dealing with the Collective Organization of Society Versus Recourse to Individual Action? Differences Between the Groups

However, there is a differentiation with the Polish group, for which the social representations are a less pronounced and more nuanced obstacle than in the case of the French and German students. Indeed, the elements of focus did not themselves even refer to the same dimensions. The foci of the social representations related to sustainable development in France and Germany refer to notions of eco-efficiency (waste sorting, cycling, buying organic products, saving energy, etc.) and to good habits. Reflection and education are on the margins of the student responses on the focused character of sustainable development, as is evidenced by other investigations too (Floro 2011; Freudiger 2010; Lebatteux 2011; Tutiaux-Guillon 2011). This kind of behaviourist approach in relation to sustainable development indicates a low reflective approach (Lebatteux, Legardez 2010). This element of behavioural focusing constitutes an additional obstacle, making it impossible to put the reality at a distance. The question thus arises as to whether, even at the university, education does not simply amount to a lesson in ethics that emphasizes the politically correct at the expense of knowledge (Legardez 2006). Indeed, the salience of individual action and individual responsibility (present in the second periphery) shows that education lacks a distancing from practice (Alpe 2006) and hence does not set the problem of the collective and systemic organization of society. A lack of social distancing from local social practices is a barrier to a critical educational perspective on sustainable development. Indeed, in a critical approach to education, it is necessary to go beyond the level of local and individual action. As emphasized for example by Freire (1974), social transformation cannot be achieved only at the individual level, but must also be a collective undertaking. The point here is not to condemn all subjective action, but from the dialectical perspective of critical education, "it is only in the combination of these two elements, when the subjective constitutes a dialectical unity with the objective, that authentic praxis becomes possible" (Freire 1974,

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29). This perspective is emphasized more recently by Grunwald (2011) in the field of sustainable development.

This type of focusing-obstacle is not found in the Polish social representations, which are oriented more towards the collective organization of society, and towards at least one problem to be addressed (rich-poor).

Thus, the Master's programme results in a partial, though differentiated, social representation, obscuring the complexity of sustainable development, which could be an obstacle to a critical, albeit formally proclaimed, dimension, especially among the French and Germans. In addition to this finding, the societal challenges are important. To underscore the importance of our findings, consider the example of the Master's students in European Studies. Since the European Union proclaims sustainable development to be one of its fundamental transversal objectives, potentially the students will have to deal with this when they respond to a call for EU projects. Thus, to avoid the risk of simply training managers in the service of the governing bodies, and in accordance with the educational objectives of forming critical citizens, it seems crucial that education strives to broaden the students' representations, by taking on board complex elements, their mutual relationships and the challenges that they give rise to, particularly if one considers that the role of education in general and higher education institutions in particular is not only to provide a certain level of employability, but to go beyond that (Adomssent 2006).

Conclusion

In this article we have considered the obstacles to the implementation of education for sustainable development from a critical citizen-oriented perspective.

In light of the proposed approach and our results, two main conclusions can be drawn. First, one can hypothesize that there are different social representations of sustainable development based on the sociocultural and political context, and on educational background. In terms of differences between the research groups, we have identified a centring on the environmental aspects and the intergenerational dimension among the German and French students, on the one hand, and, on the other hand, an emphasis on the social aspects and the dimension of international cooperation among the Polish students. But in the three national groups, the social representation of sustainable development is highly focused, despite the method (open question) often lead to multiple answers (Abric 1994; Moliner 1986), and has a highly fragmented character. As a result, it blocks a comprehensive view of the subject and the systematization of the elements of representation, and thus a grasp of the complexity involved. In addition, and as an element of differentiation between the research groups, the centering of the French and German students on everyday individual action at the expense of collective action and political-civic activity is an additional obstacle, which does not appear in the Polish group.

These elements are important social and educational characteristics that should be taken into account whenever university courses seek to develop a critical citizen-oriented ESD, as set forth in the form of principles in the programmes studied. These have the objective, at least in theory, of promoting the acquisition of knowledge, analytical skills, and an ability to think and take a critical distance. Besides the impact of the stated objectives, it is important to clarify that a critical approach to education for sustainable development should make it possible to challenge the highly utilitarian and developmentalist view

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that seems to have been adopted by current programmes, and at least by the Master's in European Studies and the Master's in Geography with a Globalization and Development option.

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The "Social Frameworks" of Teaching High School History: Teaching as Part of the Modernization of Québec Society[1]

The teaching of academic subjects does not constitute an enclave within society; nor can it be reduced to the initial training teachers receive, training which is, in Quebec, primarily psychoeducational, disciplinary, didactic, curricular and practical. Teachers do use justifications for their teaching that proceed from the disciplinary, didactic, curricular and even professional logics that predominate in their initial training, as well as "extra-professional" justifications that refer more broadly to a changing society and culture, to a vast movement modernizing Western societies with which the empowerment of the subject can be associated. History teachers get professional training that prepares them to teach. However, their teaching is, perhaps even more fundamentally, shaped by social frameworks that are external to that training, suggesting that how history is taught is heavily influenced by extra-academic social and cultural structures. Based on remarks from history teachers, we will see that how they justify what they teach relates directly to these structures.

L'enseignement des matières scolaires ne forme pas une enclave dans la société et ne se laisse pas réduire à la formation initiale des enseignants qui est principalement psychopédagogique, disciplinaire, didactique, curriculaire et pratique. En effet, les enseignants donnent de leur enseignement des justifications qui procèdent certes de logiques disciplinaire, didactique, curriculaire et même professionnelle qui sont prépondérantes dans la formation initiale, mais également des justifications autres que «professionnelles» et qui renvoient plus largement à une société et à une culture en mutation, à un vaste mouvement de modernisation des sociétés occidentales auquel peut être associée l'autonomisation du sujet. Les enseignants d'histoire reçoivent donc une formation professionnelle qui les prépare à enseigner, mais leur enseignement se laisse structurer, peut-être plus fondamentalement encore, par des cadres sociaux qui, eux, demeurent étrangers à cette formation. Comme quoi, la manière dont s'enseigne l'histoire serait largement influencée par des structures sociales et culturelles extra-scolaires. Nous verrons, d'après les propos des enseignants d'histoire, que la justification qu'ils donnent de leur enseignement renvoie directement à ces structures.

Keywords
History teaching, curriculum, modernity, social transformation, autonomy of the subject

1 Introduction

For many years, and particularly since 2006, history teaching has been the subject of a range of polemics within Québec society and intellectual circles (Cardin and Bouvier, 2009; Bouvier, 2007; Dagenais and Laville, 2009). To simplify the terms of the debate, we could say that there are two opposing

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perspectives: a political, nationalist view of teaching history which emphasizes the transmission of a strong, predetermined collective identity and memory, and a view of history that gives a dominant place to the subject's construction of his or her own representation of history (LeVasseur 2012a, 2008). The debate is characterized by overlapping political, cultural, social, cognitive and didactic elements which must be disentangled. Our interest here focuses on the social and cultural legitimation that educators give to their teaching of history. We hypothesize that such legitimation is part of a vast cultural movement that is transforming Western societies, institutions, culture, school itself, pedagogy, and the teaching of academic subjects, including history. Would it not therefore be appropriate to speak of the "social frameworks" of teaching history, that is, the structures that encompass the representations and social practices of individuals and institutional agents such as teachers?

The goal of this article is to unpack the teaching of history to show that, not only is it embedded in a government program that prescribes its general orientations as well as, more broadly, in the Québec Education Program, which covers all disciplines and guides the work of teachers in terms of curriculum and pedagogy, but such programs are also embedded in a three-fold dynamic: modernity with respect to the emancipation of the subject; the transformation of a society with respect to the production of the subject; and the weakening of the institutional model (Dubet 2002), which leads to the subject's social experience (Dubet 1994). How, then, do these three dynamics influence the teaching of history, or how history fits into a broader social whole that is in the process of being transformed? More fundamentally, how does history teaching "reflect" a vast sociocultural movement that is converging toward the autonomy of the subject?

This paper intends to link history teaching with what could be called an education for critical thinking and for citizenship, insofar as the teachers engage the students' reflexivity for understanding their insertion in history and the world, and thus favour the subject's empowerment.

2 Teaching History in a Changing Culture and Society

In times of rapid change, all academic subjects seek justification (Forquin 1989, 1991). History teaching does not evade the imperative to justify, especially as contemporary culture is characterized by a delegitimation of its own roots and society itself is undergoing profound change. Given the uncertain status of our society's cultural references, what is the symbolic, cultural, and axiological foundation of community life (Gauchet 2002)? This question was one of the greatest and most recurrent concerns of the Ministère de l'Éducation (MÉQ, Québec's department of education) in the 1990s (MÉQ, 1999, 1997a, 1997b, 1996), and of its advisory body, the Conseil supérieur de l'éducation (1993, 1998). The permanence of the "cultural crisis" in Western societies (Dumont 1987) poses a challenge to the school's cultural and political functions (Blais, Gauchet, Ottavi 2002), one that reaches teachers at the very core of their professional identity. In view of this issue in contemporary culture, what social function and legitimation do history teachers assign to what they teach?

Why should we be concerned with such a legitimation of history teaching? Because it is important to show that the teaching of academic subjects does not constitute an enclave within society; nor can it be reduced to the initial training teachers receive, training which is primarily psychoeducational, disciplinary, didactic, curricular and practical. Teachers do use justifications for their teaching

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that proceed from the disciplinary, didactic, curricular and even professional logics that predominate in their initial training, as well as "extra-professional" justifications that refer more broadly to a changing society and culture, to a vast movement modernizing Western societies with which the empowerment of the subject can be associated (Taylor 1992; Touraine 1992). History teachers get professional training that prepares them to teach. However, their teaching is, perhaps even more fundamentally, shaped by social frameworks that are external to that training, suggesting that how history is taught is heavily influenced by extra-academic social and cultural structures. Based on remarks from history teachers, we will see that how they justify what they teach relates directly to these structures.

3 Nesting Dolls: Illustrating the Ambient Individualism of Western Societies

Our hypothesis is that history teaching is embedded in structures that fit into each other, like a set of nesting dolls. From smallest to largest, we have the History and Citizenship Education program, the Québec Education Program, the institution (or more specifically what Dubet calls the "institutional model"), society and modernity. These structures are all characterized by dynamics that variously lead to the production of the subject or the autonomous individual. As part of these structures, history teaching makes an equal contribution to producing the autonomous subject, and these may even be one of its primary justifications. Thus, when history teachers explain why they do what they do with students in the classroom, their discourse is an expression of social structures. These proceed from broader and more universal registers, which orient what they do (Payet and al, 2011; Derouet, 1992; Boltanski and Thévenot, 1991).

Emphasizing the structures that determine the teaching of history does not mean that we are returning to a form of structuralism that considers teachers as automata animated by external cultural and social forces. Rather, we take an epistemological position that lies between the most stringent structuralism and the most subjectivist phenomenology. We conceive of teachers as producing a discourse that is included in a broader social and cultural context, while postulating that this discourse stems from teachers' analysis of that very cultural context. We also postulate the idea of social and cultural production insofar as educators justify their teaching with the values of subjectification. This intervening epistemological stance has two appeals for us: firstly, it sees the teacher as the author of "autonomous" discourses that are nonetheless part of broader social and cultural contexts and structures; secondly, as a result, it does not reduce these discourses solely to institutional and pedagogical elements such as official program[2] . In short, we wish to access educators' social construction of the legitimation of history teaching while not limiting this legitimation to strictly pedagogical or institutional considerations. Let us now turn to the social and cultural structures that encompass the discourse of history teachers.

[2] Note that the programs also provide a reading of society and explicitly situate themselves in the interpretation of the society that they put forward.

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3.1 Modernity as the Emancipation of the Subject and the Critique of Modernity

One of modernity's main features consists in reason's omnipotence in the natural order and the order of values. Modernity is thus a period in Western history that seeks its own guarantees within itself (Habermas 1988) while rejecting any religious or cosmological basis for man's action in the world. It is therefore characterized by the gradual liberation of man from the "multiple aspects of the principle of tradition, the principle of belonging, the principle of authority, hierarchy and duty" (Gauchet 2002, 14). We will provide two of the most decisive examples of this emancipation effort in the advent of modernity.

In his 1637 *Discourse on Method*, Descartes undertakes to use reason to sift through any opinions he may have assumed were truth. In doing so, the subject takes a step back from culture, and emancipates himself from it:

> "As far as all the opinions I had hitherto accepted were concerned, I could do no better than to set about ridding myself of them once and for all, with a view to replacing them afterwards either with better ones, or even the same ones, once I had tested them with my reason and ensured they were set straight" (Descartes, 1637/2006, 91).

In his essay "*An Answer to the Question: What is Enlightenment*", Kant continues with the Cartesian project to emancipate humanity through reason. In 1784, he writes: "Enlightenment is man's emergence from his self-incurred immaturity. (...) The motto of enlightenment is therefore... Have the courage to use your own understanding!" (Kant 1784/1991, 54). Kant assigns education the primary task of shaping judgement and leading the subject to act independently. The entire problem of education therefore consists in the difficult transition from a state of nature, characterized by independence from moral law, to a state of culture, characterized by a conscience of duty and reasonable liberty, a transition through which all of humanity reaches a state of perfection (Kant, 1993, 74-75). What is involved, therefore, is awakening in man the faculty of understanding, of judgement, through which man is able to formulate his own maxims (Kant, 1993, 117). As we will see, this objective has key pedagogical implications, particularly for official history programs.

Modernity can therefore not be dissociated from an autonomous subject who, thanks to reason, has the power to impose his will on the world of nature and values, to put an end to tradition so as to enlighten all of humanity. However, modernity thus conceived had its failures in the 20th century and the critique is now engaged in a process of self-reflection, taking the great narratives used to legitimate it as its focus. Could the grand promises of emancipation made by liberalism and communism be simply a sham, given the wars, concentration camps, and growing inequities worldwide? Could progress be no more than an illusion due to the poor performance of many sectors of industrial societies (Illich 1973)? Did the Enlightenment truly triumph over ignorance in its myriad forms and foster the emergence of a better and more just world? Clearly, modernity, erected on a critique of tradition, needs a critical examination in its turn; it generates disillusionment and disengagement, but also a necessary reshaping of the world, society and culture. What remains once modernity's great narratives have collapsed but an autonomous and reflexive subject, burdened with the task of assigning a local meaning that is shaped to fit his own condition?

Here, it would be appropriate to highlight at least two periods of modernity referred to earlier. In the first, which we could call classical, the modern subject

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belongs to a social whole that determines him. The paradox here implies that the subject's hypersocialization leads to independence (Dubet 2002). Durkheim (1989) defines a "social being" who acts rationally and autonomously, but in keeping with values, institutions and social apparatus. In this sense, his individualism is universal and abstract, in contrast with the more personal individualism (Martuccelli, de Singly 2009) studied by contemporary sociologists (Lahire 2001; Dubar 2000; Dubet, Martuccelli 1996), which characterizes the second period of modernity, or “late” modernity.

These two forms of individualism belong to different times, and different ways of being in community. The dividing line between classical modernity and the second period of modernity – "late" modernity – is located in how autonomous the subject is. The modern subject receives his identity from institutions and major structures. A worker at the end of the 19th century interiorizes a way of thinking that conforms with that of men of his degree. Social roles do not have to be invented. Social agents inherit them without necessarily questioning them. In contrast, today, the most conformist behaviour has to be justified by the individual (Beck 1998). Classical socialization thus gives way to the idea of social experience that the subject must construct (Touraine 1992; Dubet 1994). It is in this way that Dubet and Martuccelli (1996) assert that, currently, the major fact of socialization is the separation between integration and subjectification, which tends toward self-empowerment. This is why contemporary sociology has a great interest in seeing how individuals construct their social experience, weave together the disconnected components of the reality to which they belong. And, following the same reasoning, the interest in seeing how history teachers deal with the demands of a traditional teaching tied to a collective identity and individuals' increasingly marked assertion of identity.

Charles Taylor (1992) noted that the production of the autonomous subject was the primary vector of modernity; in it, he saw one of the fundamental values of our civilization. We all have a unique way of being in the world, and an essential part of who I am cannot be reduced to what others are. But do the issues that structure societies not remain "independent" from individual consciences? Are they not partially defined by "independent" social frameworks?

3.2 Social Transformation, Domination and Subjectification

To say that Western society is changing at a faster and faster pace is a truism. The challenge actually consists in theorizing the change. Connected with our analysis of the theme of the subjectification of culture, behind the change, we can glimpse a tension between the constraints upon the individual, and the individual's striving for freedom. Here, modern societies operate according to a dual register. On one hand, there is the productive world; on the other, the subjective world. Here, Touraine (1984) speaks of the system and the actor, Marcuse (1980) of civilization and culture, Habermas (1973) of instrumental rationality and intersubjective rationality that is specific to the social world as experienced. Others, like Québec sociologist Fernand Dumont, speak of the instituted and the project (1968). These dichotomies point us to a dual social dynamic in which domination and individual liberty are permanently opposed.

The Marcusian dichotomy is apropos here. Civilization constitutes the world of production and the world of the instituted, both of which reproduce existing social forms. Production makes it possible to create the surplus that, in material terms, ensures man's survival. Institutions then enshrine the values and norms that structure trade and discipline the forces of labour. They play a social control

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function, without which individuals would refuse to engage in an alienating industrial work process. However, Marcuse tells of the existence of another world, that of culture, Eros, desire, Utopia, of aesthetics, the project and emancipation, liberation from constraints that repress the instincts of man channelled for productive purposes (1968, 1963). Inasmuch as institutions play a role of critique, a role that consists in defining the primary aims of society and denouncing civilization's failings and dysfunctionalities, they belong to the culture that allows the individual to escape from his immediate condition, transform the world, and thus attain complete liberty.

In the end, Touraine (1997, 1992, 1984) picks up a similar analytical scheme. The system is composed of the forces of industrial production, and the subject refers to the individual who, at the margins of the economic system, the vagaries of globalization, instrumental rationality and even at the margin of his sometimes stifling culture of origin, "forges" an identity through which he expresses his belonging to the world and society and refuses to be reduced to the status of a cog in an alienating economy or reproducer of norms in his community of affiliation.

In short, in response to the world of civilization, the economy, instrumental rationality and the instituted, there is an insistence on individualism as a salient fact of modernity which, without necessarily leading to revolution, enables the individual to assert his identity.

3.3 Weakening of the Institutional Model and Creation of an Area of Freedom for the Subject

Western society is changing, along with its primary structures, including its institutions. The way institutions work is no stranger to the idea of the production of an autonomous subject, that is of core importance in the “educating for” projects. Here, we can look to Dubet's work on the institutional program (Dubet 2002). It is a method of socialization, dominant until the 1960s or 1970s, in which the values passed on by the institution defined the roles that individuals took on (including the role of student), modelling their behaviour and marking their personality (Dubet, Martuccelli 1996). There is a correspondence here between the institution and the individual, with the latter getting some of his identity from the former.

Yet sociology instead tends to show that, currently, the social actor does not simply passively interiorize a set of values that makes the social cohere, but constructs his own experience by making connections between registers that stem from logics of social action in tension which the actor must endow with some unity (Dubet 1994).

May we consider that history teaching illustrates such a social transformation, in which the logic of subjectification runs up against the logic of integration? Is students' construction of their own representation of history compatible with teaching's traditional function, which is to constitute collective identity by getting students to interiorize symbols (events or figures) that serve as social bonds? Our analysis of educators' discourse will make it possible to take a stand on the issue of history teaching's potential function of subjectification or incorporation, and of how it is inscribed in an education in critical thinking that fosters the development of reflexivity in the student.

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3.4 Educational Reform and the Québec Education Program

From this point on, our theoretical investigation changes course. It will deal less with our civilization's structures and social and cultural shifts than with the Québec school, in particular the official texts that define its curricular and pedagogical objectives. The educational reform that began in 1997 (MEQ 1997b) was the occasion of an in-depth look at what education should be at the dawn of the 21st century.

Of the reform's many provisions, let us focus on the overhaul of the curriculum and the desire to make some breaks with prior programs. A little history is in order here. One of the adversaries reformers openly targeted was the behaviourism that led to the over-atomization of educational content into a large number of very hierarchical objectives (MEQ 1997b; Legendre 2002; Inchauspé 2007). The pedagogical corollary to the curriculum reform involved a confirmed desire to conclusively substitute active methods for the transmissive methods that, though challenged by the objective-based programs of the 1980s, had remained in teachers' practices. Under the reform, a student's cognitive activity is considered to be the determining factor in constructing knowledge (declarative and procedural), thanks to the teacher's guidance. However, it would be false to claim that the only things resisting the reform were behaviourism and transmissive methods. Prior to 1997, school culture did include objective-based programs, but it was also characterized by psychological humanism, inspired by the currents of open pedagogy (Simard 2012; Mellouki 2010) geared toward personal development (LeVasseur 2012b; 2010). Yet the advisory and prescriptive reports behind the 1997 reform openly denounced the whole-person development approach for having neglected the student's cognitive development (MEQ 1997a). The 1997 reform's cultural orientation thus involves a synthesis between a kind of humanism and a kind of cognitivism, here used very broadly to refer to the development of intelligence and information processing. The reform promotes educational content that focuses on superior capacity for abstraction as part of a philosophy of education that makes the person and his freedom of thought one of the fundamental values of the Québec school system. According to the Québec Education Program (MELS 2007):

> "The Québec Education Program draws on several theories of learning that share a recognition that learners are the main architects of their competencies and knowledge (...) cognitivism, because it describes the processes enabling individuals to incorporate new knowledge into their knowledge system and use it in new contexts; constructivism, because it presents knowledge as the result of actions (originally concrete and subsequently internalized) that are taken by individuals in relation to objects, representations or abstract statements; social constructivism, because it stresses the social character of thought and learning, and views concepts as social tools that support the exchange of viewpoints and the negotiation of meaning" (MELS 2006, 16).

Clearly, students must be the centre of learning activities and the authors of the meaning with which to endow knowledge. Learning is defined with reference to complex processes and knowledge that foster the development of a subject that is here more cognitive than ethical.

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3.5 The New History Program and Citizenship Education

The Québec Education Program, introduced above, certainly guides the work of history teachers, but less so than the new History and Citizenship Education Program. In this program, the Ministère de l'Education stresses the student's action, which is highly articulated around the program's three competencies. The first competency, the examination of social phenomena from a historical perspective[3], must allow the student to better understand the past in relation to contemporary social debates. The second competence consists in the student's acquisition of a historical method with which to interpret the past. As with the earlier objective-based programs, the student must play an active role in this methodological investigation process, but the fact that he must tackle it by means of the "competence", which is what is evaluated, reinforces the objective. In keeping with the QEP's constructivist orientation (cf. 2.4), it is not solely up to the teacher to provide the student with a prefabricated vision of history and society. Teachers must often plan learning situations that get students to slowly acquire the historical method (over the course of four years), which ensures that students construct their own representation of history. It is thus students who, equipped with the understanding of social debates enabled by the historical method, engage in the world and in citizen action, which corresponds to the third competence. The priority given to students' historical representations, compared with a unitary, collective vision of history that is imposed on a student, shows that the program is highly influenced by individualism and is in line with a pluralist vision of society and culture:

> "One of the challenges facing a pluralistic society like that of Québec is to reconcile the diversity of identities with shared membership in a community. All students must develop a sense of who they are relative to other individuals characterized by numerous differences and must define themselves in relation to others, by relating to others. Taking otherness into account is thus an essential element of identity development. This process enables students to observe that the diversity of identities is not incompatible with the sharing of values, such as those related to democracy" (MELS 2006, 22).

The new program does deal with intellectual training and provides teachers with a pedagogical orientation but, at the core, it still contains an idea of what the social bond must be. All education programs harbour a vision of society, how it works, the transformation that is needed and the role students will have to play (Forquin 1989; Durkheim 1990, 1989; LeVasseur 2010, 2002, 1999). Now, what vision of society and more specifically of the social bond is actual history teaching (differentiated from its official program) aligned with? In other words, even though the QEP and the History and Citizenship Education program seem to focus on educating students who are morally and intellectually independent, it remains to be seen whether teachers buy into such a vision of education and a function of history that favours the independent training of a student over the transmission of an inherited, unitary historical narrative.

[3] The program's core concept is that of "society." A "social reality" refers to a specific society in a given era.

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4 Methodology

The data on which this article is based come from a research program that focuses primarily on the connections between school culture, society and culture. Below are the key methodological elements.

4.1 Research Purpose and Premise

In the course of our research, we pursued a primary objective, which was to determine how high school teachers manage to reconcile a) the Ministère's history education program, b) the Québec school's socialization mission and c) the challenge of carrying out this mission in the context of a plural society (particularly in terms of ethnicity) and a culture that is highly individualistic and critical. In other words, what is involved is deciding on history teaching's potential social function as perceived by teachers. At the outset of the study, influenced by social debate on the subject of history teaching, we hypothesized a teaching of history that would be divided between partisans of the transmission of a unitary collective memory, and partisans of a more constructivist kind of teaching, in which students equipped with the historical method constructed their own representations of history. However, the fact that our study was conducted mostly in Montréal's public high schools prompted us to set aside that hypothesis. For a variety of reasons that we will set out in the next section, teachers who work in high-density multi-ethnic environments think that passing along a collective memory can no longer be justified in such a context. What, then, are the social purposes of teaching history? If the Ministère de l'Education's 1997 policy statement made socialization one of the three core missions of Québec schools, along with instruction and qualification, how can history teaching that is no longer focused on transmitting collective memory play a role in socialization?

4.2 Data Collection Tools

To answer these questions, we developed a questionnaire designed to determine the social function teachers assign to history (its links with the common culture, identity formation of communities, ethnic and religious groups, and individuals), how teachers appropriate the government program, the legitimation of teaching depending on contrasting social settings and teachers' years of experience. The questionnaire was primarily based on a pilot study on the contribution of academic subjects to shared culture (LeVasseur 2007-2010). In the context of the study, we met with teachers in all subjects on the program in primary and secondary school, including three high school history teachers, with whom we explored the issue of the purposes and the social context of history education.

In a later study that focused specifically on the teaching of history in relation to the formation of the common culture (LeVasseur 2008-2012), we did 22 semi-structured interviews of about an hour designed to achieve the goals we had set: determine the links teachers establish between history, government programs, Québec schools' socialization mission and the features of contemporary culture (critique, nihilism, individualism, pluralism, cultural and epistemological relativism, etc.); identify the impact of the establishment's cultural make-up on the legitimation of teaching, as well as the impact of years of teacher experience.

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Our 22-teacher sample was composed of 15 men and 7 women. For reasons pertaining the physical organization of the research and a variety of administrative constraints, 20 of the 22 teachers worked in establishments in the Greater Montreal area, with only 2 establishments located elsewhere (in Quebec City and its surroundings), in social settings that differed both economically and ethnically (clienteles that are mono-ethnic Francophone, Italophone, Anglophone, multi-ethnic with people of French-Canadian descent forming a large or small majority or a minority). These institutions had students who were "strong," "average" or "weak" in terms of learning. A few teachers (2) worked in anglophone establishments in French-immersion programs. In terms of years of experience, there were just as many teachers who were at the start of their careers (5 years of experience or less) as there were in mid-career (6 to 15 years of experience) and late career (15 or more years of experience). In short, the sample is characterized by a sizable number of variables which we did not isolate in the present analysis, although we are aware of the importance of taking Montreal's geographic, ethnic and social variables into consideration.

The data were subjected to content analysis (Grawitz 2001). This is intended to identify themes that emerge from a reading of the interviews, and group the themes so as to identify the social function associated with the teaching of history. In other words, we read the interviews based on our research questions. We paid particular attention to all elements teachers mentioned that evoked the relationships between the individual and society, the transformation of the social bond, the issue of memory, students' personal identity and collective identity, the development of critical thinking in students, including students' ability to step back from their identity, culture and social allegiances, without seeking to give a stamp of approval to any given orientation for the teaching of history.

5 What Teachers Say About the Sociocultural Function of their Teaching

An analysis of our data essentially shows that teaching that focuses on transmitting an inherited, unitary collective narrative no longer mobilizes Montreal teachers. In fact, the transmission of a historical narrative focused on the origins of French Canadians or Québecois of French Canadian origin[4], on the events that catalyse community life, historical figures likely to galvanize the nation and cement collective identity is being replaced by the production of a subject who is an independent thinker. In what follows, we will start by showing that history teaching aimed to marry knowledge of history with a moral project, one of collective survival or collective emancipation. We then show that, as of the start of the 2000s, teaching takes a more critical turn, in which students need to take a step back from any prefabricated representation or historical discourse.

5.1 Collective Identity as a Reference for History Teaching

From the end of the 19th century and during the 20th, in French Canada, history teaching was highly nationalistic, in the sense that the content was designed to make students aware of what differentiated them, in terms of a

[4] In this text, as in the language in current use by French-speaking Quebeckers, we will use the term "Québécois" (and its derivatives) to refer to Quebeckers of French-Canadian origin. We will provide additional details where necessary. Also note, however, that prior to the 1960s, francophones from the province of Québec referred to themselves as French-Canadians; after the 1960s, with the dawn of a modern nationalist sentiment, they referred to themselves as Québécois.

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nation, from English Canadians and Americans[5]. In the classical colleges that dominated high school education from the 17th century until the second half of the 1960s, all subjects had to serve moral ends that were heavily tied to the religious and social thinking of the Catholic Church. Although, administratively, education was under the jurisdiction of the Québec government, for all intents and purposes, the Catholic clergy controlled the content of education for French Catholics, including languages, science, history and philosophy. Of course, history teaching could not evade such a moral orientation and the essentialization of the "character" and "genius" of the "French-Canadian race", to use the terms of the time:

> "Follow in the path of the explorers, founders, missionaries; enter parliaments to hear Papineau, Lafontaine demand our rights. Put the heroes on pedestals, in beautiful grandeur; discover big religious, patriotic and moral lessons. Our youth will be filled with enthusiasm and want to reproduce, in their own lives, some of the virtues admired in national history" (Conseil de la Faculté des arts 1937, 523-524).

The history taught in the classical colleges was less concerned with objectifying events than in defending and illustrating the main elements associated with the clerics' nationalist thinking, i.e. language, religion, and French-Canadian mores. Knowledge articulated around a normative ideal was unable to separate itself from morality. History disseminated French-Canadians' ideology of survival through panegyric and the evocation of the founding fathers' exploits. In the mid-1960s, the public high school history program was as follows:

> "Our history lessons will therefore work to illustrate the miracle of our people's survival and growth, while cultivating a healthy, strong, sympathetic and conquering patriotism that will primarily manifest itself through the concern for giving a full measure of work, effort, dignity of life, living faith" (Government of Québec 1963, 196).

History teaching thus took the form of a moral prescription intended to forge the collective identity of a people who were defined as agricultural, French-speaking and Catholic.

At the end of the 1960s and in the 1970s, the traditional French-Canadian nationalism yielded to a kind of more modern "neonationalism", with French still at its core, but in which morality and a religious vision of the world were replaced by the modern values of securalism, scientific rationality, progress and pluralism. With respect to history teaching, the Parent Commission report, "Inquiry on Education in the Province of Québec," published from 1963 to 1966, hotly denounced the above-described national and religious predication and recommended a more scientific, methodological approach to the teaching of history, described as a tool in educating the citizen in critical thinking (Cardin, 2010). However, in fact, history teaching continues to be based on a nationalist outlook and convey the discourse of survival in an Anglo-Saxon continent (Létourneau 2010). On this issue, here is a statement from a history teacher with more than thirty years in the classroom. In 2007, he was about to retire.

[5] Here, this teaching of history was consistent with what was being done elsewhere in the world: forming a citizen of the nation.

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According to this teacher[6], the purpose of teaching is to transmit a national narrative, to convince students that the Québécois are oppressed in the Canadian constitution, and to awaken the nationalist fibre of the younger generation:

> "I've always been a nationalist. In teaching Québec and Canadian history, I explain how the political system developed, at least until 1982. The message I give them is something I'm passionate about and you don't pass along a passion without reference to who you are. One of my students asked me, once: "Given how long you've been a teacher, how many of your students will vote for the Parti Québecois?" I've probably influenced a few... We have all been influenced by teachers. Today's young teachers don't think about being a "master." Being a master means controlling a certain kind of truth, having the ability to pass it along, to sway. That's being a master" (Subject 1, history 2007).

Here, teaching comes from an intellectual engagement in a political cause that is presented to students, not necessarily in a doctrinaire manner, but in such a way as to raise some awareness. The fact remains that this teaching is an extension of a reading of history that treats the Québécois as a nation that is endangered. Insofar as it gives Québécois a certain vocation, and is articulated around a certain type of morality, it is no different from the teaching delivered by the religious at classical colleges, about which Québec historian Galarneau said: "Religion saturated and shaped every moment of daily life, provided the argument for any proof, and furnished the answer to every question" (1978, 215).

5.2 The Figure of the Subject as the New Reference for the Teaching of History

This teaching of history, which essentially aims to put forward an inherited and unitary narrative intended to consolidate French-Canadians' collective identity prior to the 1960s, and that of Québécois as of the 1960s, to give a reading of a people's destiny and vocation in North America or in the context of the Canadian constitution, this teaching, shall we say, is being replaced by a teaching that is designed to put a distance between any a priori representation of history, and the representation students must construct for themselves.

5.2.1 Teaching as Intellectual Self-Defence

A number of teachers in our sample stressed the fact that teaching must lead to developing in students a critical stance or distance arising from the need to challenge discourse (Boltanski, Thévenot 1991). A teacher we encountered during our first study (LeVasseur 2007-2010), responding to a teaching that was overly "ideological" or politicized, asserted the importance of working first and foremost toward the development of independent minds:

> "The final end is to create free individuals, free thinkers, 'unmanageables', people who cannot be manipulated by any ideology. My strength is that I provide all the guidelines for that and I don't see history as an instrument, for example, for molding a

[6] This teacher, who is part of the 1st enquiry and not representative of the 2nd one, had started his career in the 1960's. In comparison, the majority of the other teachers of our research had started their career in the late 1990's or year 2000's.

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student who is not from Québec. The idea is to provide students with points of reference" (Subject 2, history 2007).

In our second study, which focused specifically on the teaching of history and its social function, teachers' discourse was essentially in line with what the teacher above said. Everyone stressed the need for a teaching that abides by the principle of distance and critique with respect to various normative, ideological or political visions of history:

> "For a very long time, history teachers were seen as separatists, sovereignists, Parti Québécois supporters[7], and very strongly pro-union. People would talk to me, realize my stance was a little federalist, a little anti-union, and say it didn't make any sense. So, since I started teaching, I've paid careful attention to the impact we can have on students. This is why I put so much effort into developing their critical thinking abilities. I try to get young people to say: 'Well, that's nice. The teacher says that and that's okay. But is that what I think?'" (Subject 4)

Other teachers note that students are exposed to a variety of discourses which they must be equipped to face. The media, somewhat short-sighted views of the world, parents' prejudices must be treated with caution, at least in the interim, until students have been able to do their analysis:

> "You need a critical distance." "Why do you say that? Show me the evidence!" Some [students] will say anything. "I saw that on television!" "Yes, okay, but show me the proof." They are frequently sponges, but they'll pick up information anywhere." (Subject 21)

> "The kids are 12, 13, 14 years old and, sometimes, things come out of their mouths that apparently come from comments the parents have made, who are watching the news on television. I have trouble believing that students, at their age, are already making remarks like they sometimes do. Yes, September 11 happened, and there is some hatred toward Muslims... Because the nineteen hijackers were Muslims. So, of course, all Muslims are terrorists! Stereotypes, prejudices, they soak them up and sometimes cannot explain why" (Subject 10)

> "I think that, at least at our school, most of the ideas that our students have about history are not actually ideas about history, but are just opinions they have, and then they make up stories to fit those opinions. And it would be horrible to leave them with that view alone. It's the main part of our job, in a way. It's to find a way of bringing those views without invalidating them necessarily – some of them need to be invalidated. But to try encourage the sharing of different historical perspectives and then... In the dialogical way, to present different ideas about how things can be understood and to also present information that they don't have access to otherwise. To help them understand, appreciate, where their own view comes from and where other views come from and why." (Subject 14)

The next teacher criticizes a lack of independent thinking among students who, in her view, bought into the most conformist thinking:

[7] The 'Parti québécois' political mission is Quebec's independence. Many partisans want the teaching of history to stress Quebec's political, economic, social and cultural dependence in the framework of the Canadian confederation.

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> "We're such an individualistic society, but we aren't individualists. We're sheep, we follow the prevailing thinking, the trends... I don't know, what do they identify with? With fads? No, they don't really have an identity. Sometimes, they even reject their own identities to fit into a mould or follow a trend. They're conformists. But they're very 'individualistic.'" (Subject 8)

The interview excerpts we quoted above show that teachers make an effort to get students to create their own ideas of history and the events in the headlines. This is quite remote from a vision of history constructed as the national dogma. It can also be seen as supporting the development of a self-critical attitude, by distancing from the commonplaces supposed to be the basis of the students' view of the world.

5.2.2 The Desubstantialization of Individual and Collective Identities

Aside from this orientation of teaching which looks like a kind of intellectual self-defence, other teachers focus their analyzes on the existentialist challenge that forces everyone to construct their own identities and representations of things, the world, and history:

> "Our affiliation is primarily our decision, and it's also multiple, it's varied; it isn't something that is dictated to you. It's a choice you make. My sense of nationalism is rooted in James Joyce. To be an artist or a true individual, you leave nations, religions and language behind you, to discover yourself. Who am I? That's something that I teach, obviously." (Subject 7)

Here, we are closer to the sociological phenomenon we attempted to pinpoint in the theoretical section of this article. The institutional functioning of classical modernity, which prevailed in the first half of the 20th century, is fading. Institutions have lost the ability to enlist that made the social system cohere and gave the individual a strong impression that he lived in a world that was an extension of himself. The individual adhered to social values, governed his conduct according to standards passed along by institutions, and the social roles he took on marked his personality profoundly. This type of socialization was best theorized by Durkheim, for whom the individual bore the characteristics of the society to which he belonged. What the individual is as an abstract social being is more real than what he is idiosyncratically. However, the teacher we just quoted essentially says that socialization is now less a matter of integration than of taking a step back from values, standards and social roles that previously governed collective behaviour, as well as from the collective narratives that structured identities. To put it in the manner of Dubet and Martuccelli (1996), social modernity is currently characterized by a separation between integration (as defined by Durkheim) and subjectification. Subjects no longer allow themselves to be reduced to the set of social roles they take on; similarly, history students do not allow their identities to be reduced to the interiorization of an essentialist national narrative. Particularly, as the next teacher points out, the plural identity of societies – and individuals – (Lahire 2001) makes the idea of a substantified, inherited historical narrative obsolete. How can a foundational vision of history be transmitted in a context in which meanings are labile, fleeting, plural and likely to be amalgamated by students into complex and unique identity arrangements?

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> "There are many different collective identities, different people have different collective identities, and they have different individual identities. I don't think there is a singular one. And I think that it doesn't mean it's not important to dialogue about what those identities are, and to maybe work towards a negotiation of a collective identity, where people can be invested in one another and each other's well being. But I don't think there is a single one." (Subject 14)

In other words, here, the teacher is proceeding with a very pointed critique of a rationalist vision of identity. There is no necessary fit between history, a collective identity, and all Québécois of all origins. Identity pluralism in no way allows itself to be reduced to a single category; teaching must not seek to reduce it but rather aim for intersubjectivity and dialogue. In exchange, it is then appropriate to let the history class allow a conflict between interpretations and set aside the "right answer syndrome":

> "They are of course going to say: "I want the teacher to give me the right answer." That's what they tell us: "Sir, what's the right answer?" I tell them: "There isn't one. Or there are 33 right answers and mine's the 34th. You have to take your own stance. It's part of your job as a future citizen to take a stance. If you're followers, never mind." (Subject 4)

In short, we have seen that it is students who construct their knowledge and representation of the past. As a result, for the teachers in our sample, teaching that focuses on interiorizing a unitary national discourse seems evanescent. What, then, is the cultural reach of this kind of transformation of the teaching of history? How does the transformation lead us to see that the history teacher's social function has changed?

Conclusion

In light of the interview excerpts cited above, teaching seems to be oriented toward recognizing students' independence from history and thus following the movement identified by sociology in which modernity is characterized by the gradual emancipation of the subject with respect to the social whole. In concrete terms, this is expressed by teachers' break from the imposition of any normative referent or *a priori* vision of history and, consequently, by the freedom accorded students to construct their own representation of history. This way of teaching history is, of course, aligned with didactic considerations, a "contemporary" way of teaching history that is centred in particular on the student's acquisition of a method of historical analysis that is tied to historical thought. In this article, however, we have argued that the importance teaching places on students' construction of their own representation of history derives just as much from a movement of civilization characterized by the empowerment of the subject. A didactic orientation and this sociocultural movement are not necessarily incompatible; however, what we have primarily sought to demonstrate in this article is that the teaching of history proceeds from structures (social and cultural) that encompass it and go well beyond the spheres of didactics and curricula. This is why we refer to the social frameworks of history teaching, so as to unpack it and demonstrate that it can be apprehended from a sociological perspective. In other words, the didactics of history could very well see in the sociology of knowledge, which maps school knowledge to social and cultural contexts, an ally in giving teachers in training a broader view on their discipline and its development.

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If teaching history could contribute to an empowerment of the subject, clearly it contributes also to an education for critical thinking, insofar as it is apparently based on a reject of the prefabricated views of the past and of what Lyotard (1979) called the "great narratives of legitimacy". This is far from a teaching by passing on knowledge.

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Citizenship Education to Nanotechnologies: Teaching Knowledge About Nanotechnologies and Educating for Responsible Citizenship

We present a research based on a project for citizenship education to nanotechnologies in a French high school which aims at teaching the specific characteristics of nanotechnologies, of their fields of application and of the controversies which are linked to them. At the junction of Socially Acute Questions didactics and of the cultural-historical Vygotskian theory, we analyze the knowledge at work in a debate on the promises and risks connected with nanotechnologies. The knowledge mobilized by the students (17- to 18 years-old) in their dialogical interactions can refer back to the archetypal narratives whose origin lies in men's social and cultural history. Through the joint effect of cumulative talk and exploratory talk, the students co-construct the concepts linked to the Social Ethical Issues: risks and human enhancement. We show that the debate at school leads students to be able to construct reasoned opinion and to position themselves in their environment in a responsible way. This educational innovation appears to be relevant for combining the learning of academic and cultural contents with social competencies necessary for committed citizenship education in the field of nanotechnologies.

Keywords
education for nanotechnologies, socially acute questions didactics, social ethical issues, debate, dialogical exchanges analysis

Cette recherche porte sur un projet d'éducation citoyenne aux nanotechnologies dans un lycée français dont l'objectif est d'enseigner les spécificités des nanotechnologies, leurs champs d'application et les controverses associées. Pour analyser les savoirs en jeu dans un débat portant sur les promesses et les risques liés aux nanotechnologies, nous croisons la didactique des Questions Socialement Vives et la théorie historico-culturelle vygotskienne. Les savoirs mobilisés par les élèves (17-18 ans) au cours de leurs interactions dialogiques peuvent se référer aux récits archétypiques puisant leur origine dans la culture humaine. Les élèves co-construisent des concepts liés aux questions socio-éthiques (risques et augmentation humaine) par le biais de l'articulation des discours cumulatifs et exploratoires. Nous montrons que le débat scolaire amène les élèves à construire une opinion raisonnée en se positionnant dans leur environnement de manière responsable. Cette innovation pédagogique semble pertinente pour articuler l'apprentissage des savoirs disciplinaires et des compétences sociales nécessaires à une éducation à une citoyenneté engagée dans le champ des nanotechnologies.

Mots clés

éducation aux nanotechnologies, Questions Socialement Vives, questions socio-éthiques, débat, analyse des échanges dialogiques.

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1 Introduction

Over recent years, programs prescribing educating for have become widespread. The Council of Europe (2008) promotes global education as a holistic "education that opens people's eyes and minds to the realities of the globalized world." The United Nations support Peace Education Programs which teach children and young people how to acquire social competencies in order to better live together and to commit themselves as citizens. Educating for responsibility is a recurrent theme in French official texts. Citizenship and Health Education Committees aim at the development of individual and social responsibility behavior: the official circular of July 2004 at the origin of Environmental Education for Sustainable Development (EESD) stipulates that students must be able to "position themselves in their environment and act within it in a responsible way".

These educational actions are more concerned with the development of social and civic competencies than with the knowledge assigned to academic subjects which have been differentiated by French institutions since the 19th century.

We present a project for citizenship education to nanotechnologies in order to answer the following question: which scientific and technological culture should 21st century school be promoting? (Simonneaux, Legardez 2011; Lebeaume 2011). We would like to show the interest of combining the *teaching of* characterized by academic and cultural contents with *educating for* characterized by social competencies to promote a new form of teaching appropriate to contemporary techno scientific evolution (Panissal, Brossais 2011). This new approach aims at teaching the specific characteristics of nanotechnologies, of their fields of application and of the controversies which are linked with them.

Our research lies at the junction of Socially Acute Questions (SAQ) didactics and of the cultural-historical Vygotskian theory to analyze the knowledge at work in a debate on the promises and risks connected with nanotechnologies.

Our research questions are as follows:

Which knowledge related to the social ethical issues connected with nanotechnologies (SEI) do students mobilize in their dialogical interactions?

Do students co-construct the knowledge stemming from the SEI?

2 The Controversies Related to Nanotechnologies

Research into the risks of nanotechnologies for humanity and the environment as well as into its ethical, legal and social effects has been developing for about ten years. So has research on the technological and scientific aspects. In the USA and Europe nanotechnology is now firmly embedded in the consideration of ELSI (Ethical, Legal and Social Issues).

The public debate organized from October 2009 to February 2010 in France, regarding the general options in terms of development and regulation of nanotechnologies is part of this perspective of "Precocious consultation of the government towards the population before the decision-making and the concomitant production of high-quality information made available to anyone interested". The positive aspects of nanotechnologies in the medical field are underlined (for instance, the hopes linked to cancer therapy or the miniaturization of the electrodes directly implanted in the central nervous system). Such a personalized type of medicine would be based on the quality of diagnosis and on the powerful action of treatments. Fears and reproaches have been voiced as well: there are numerous uncertainties in the field of health risks, about impact on the environment, in the field of individual freedom or potential uses regarding security; the development of nanotechnologies would be a factor

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increasing the gap between countries from the North and countries from the South (Benoit-Browaeys, Colin-Detcheverry, Lebret 2010; Bürgi, Pradeep 2006; Falkner, Jaspers 2012).

In this effervescent context linked to the excitement caused by nanotechnologies, categories of SEI have been defined in civil society. We present those by Lewenstein, Professor of Science Communication, by Sandler, a philosopher on Ethics and Technology, by Bensaude-Vincent, a science philosopher and by Benoit-Browaeys, a science journalist.

Beyond the documents produced by the National Science Foundation, Lewenstein (2005) creates a category of what is considered as a SEI in nanotechnology. He enlists this way the environmental issues (toxicity, resources, pollution), the job market issues, the educational issues (implementation of interdisciplinary prescriptions, students' education...), life privacy issues (individuals data base, access control to private data), national and international political issues (developed countries and under-developed countries, territory management), intellectual property issues (patents) and finally, human enhancement issues (boundary between treatment and modification, natural/artificial, definition of a "normal" human). Sandler (2009) proposes a SEI typology. He considers that nanotechnologies, even if very promising, will not be able to fully exert their potential if they are not associated to an adequate ethical and social questioning. His categorization in five items is an intellectual grid to identify a reasonable and reasoned development about nanotechnologies. He distinguishes: the social and environmental context (toxicity, inequalities, education...), the morally contestable practices (weapons, synthetic biology...), the role of nanotechnology in the social system (technoculture), the issue of life and impact on social standards (nanomedicine progress, privacy...), and finally the issue of human being transformation considered thanks to NBIC (Nano, Bio, Info, Cognitive) convergence. A report entitled "Nanotechnology, Biotechnology, Information Technology and Cognitive Science: Converging Technologies for Improving Human Performance" draws up a diagnostic of the NBIC technologies progress and their most promising aspects for humanity's future as well as a road-map for their development (Roco, Bainbridge 2007). It is not only a nanoconvergence (convergence of the scientific disciplines) but also a NBIC convergence that includes disciplines such as sociology, cognitive psychology, artificial intelligence, neuropsychology, etc. The core idea of this report is to orientate research activities of all disciplines towards the enhancement of human physical as well as intellectual capacities, through sensory capacities increased tenfold by implants, computer-human brain interfaces, and interfaces between human brains for a better communication. This human enhancement, also called "transhumanism"[1], would render post humanity possible thanks to the technological transformations that it would permit (Larrère 2008; Schummer 2009).

The ethical and social issues are structured around four main preoccupations. (1) "How can we accept products containing nanomaterials?" refers to the issues of toxicity and control; (2) "Is the nanoworld and its ubiquitous computing technology desirable?" is linked to the potential attacks on individual freedom; (3) "What are the objectives of nanotechnologies?" address the possible deviations in terms of artificiality vs. nature and of enhancement of the human

[1] Transhumanism is an international intellectual current campaigning for the extensive use of science and technology for improving and enhancing physical and mental human performances. This project considers that ageing, illness, suffering, handicap and eventually death need to be eradicated, thus revisiting deeply human condition.

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being; and (4) the question "Who will have access to the benefits of nanotechnologies or who will be exposed to their risks?" regards the issues of balance between the countries from the North and those from the South, between the populations who are economically favored and those who are not (Benoit-Browaeys et al. 2010, 17).

Bensaude-Vincent (2012) takes up again the checklist of the ELSI approaches: (1) Risk assessment, cost/benefits (transparency, labelling), (2) Privacy, individual freedom, (3) Security (uncontrollability, terrorism...), (4) Enhancement of human nature and (5) Social justice (global divide). In her opinion, among the advantages of this approach we can find Health and Security alerts and the raising of scientists and politicians consciousness. However, she criticizes them for giving the illusion of mastery and control with this standard checklist. Moreover, the ELSI may make people think that public opinion is concerned only with risks which might be technically solved.

In this paper, we focus on how these controversies are dealt with at school through the SAQ teaching that aim at contributing to training students for understanding nanotechnology issues, for identifying the actors, their points of view and the reasons why they adopt them, for anticipating the consequences of the choices which could be made, even for directly taking part in the public debate (Audigier 2011).

3 Socially Acute Questions (SAQ) Didactics

SAQ didactics lies within the trend of educating for: sex, health, safety, security, sustainable development education and above all citizenship education since all these actions promote educational projects (Audigier 2000) and also aim at readjusting an educational model, mainly focused on knowledge, by reasserting the role of the social agent in a citizenship perspective (Lange, Martinand 2010). Indeed SAQ combine scientific and social problems, values and ethics (Simonneaux, Legardez 2011), dealing with them requires knowledge but also the taking into account of social issues, of values and ideologies. Within the frame of this nanotechnologies education project (Panissal, Brossais, Vieu 2010; Brossais, Panissal 2013), our aim is to confront students with authentic situations in relation with today's technologies so that they develop, beyond ways of acting, ways of thinking and to provide them with keys to their environment. Indeed the transformation of our societies through powerful technoscientific acceleration requires adaptation skills and conceptualization which were not available in the previous culture (Lebeaume 2010).

SAQ didactics also lies within the field of Post Normal Science (Funtowicz, Ravetz 1993) and post modern risk society (Beck 1986). According to Post-Normal Science, science is affected by uncertainties and value-commitments, facts are uncertain, values are in dispute, stakes are high and decisions are urgent: scientific demonstration must be complemented by a broad societal dialogue. Therefore, nanotechnologies lie within the field of Post Normal Science as a science with strong links to human needs, thereby leading to large uncertainties, major issues, values, and requiring urgent decisions. Decision processes of PNS should include open dialogue with everyone concerned thus introducing the concept of "extended peer community" and including strong consideration "to extended facts" that is to say, data from sources outside the orthodox research. Consequently the questions raised by the development of nanotechnologies are very important. The whole training process that we present below takes into consideration that "extended facts" are not limited to the scientific field of nanotechnology.

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The production of new scientific knowledge aims at solving the numerous negative effects (waste, pollution, new illnesses) induced by technosciences (Beck 1986). According to Beck, the worlds of technology, industry and science form a network of general complicity leading to general irresponsibility. By giving considerable importance to uncertainties and risks, he criticizes scientific rationality. Science cannot be mere theoretical production; through what he calls "reflexive scientifisation", researchers have to anticipate the consequences, the uncertainties and risks of scientific progress.

The risks linked to new technologies are unfamiliar, they are considered as being imposed, having irreversible consequences, being beyond repair once identified and above all concerning everybody including generations to come. In a risk society, technological development benefits the community and the individual but at the same time increases the risks related to the creation and application of these technologies. The interest of teaching new technologies (Lebeaume 2010, 2011) might consist in allowing students to integrate the way of acting and thinking required by technosciences and more particularly by nanotechnologies, in order to go beyond the old and recreate the new (Vygotski 1985), and in fostering the adaptation of new generations in a social, economic and technoscientific environment. Lebeaume (2011) adds that current technoscientific transformations require the redefinition of the cultural project of the school system so as not to create disjunctions between ways of life and ways of thinking.

Within the frame of SAQ didactics related to nanotechnologies we have shown the interest of actions such as "citizenship education to nanotechnologies" (Panissal, Brossais, Vieu 2010; Panissal, Brossais 2011) which contribute to educating for risks that may be caused to humanity and their environment by nanotechnologies (Simonneaux, Panissal, Brossais 2011).

4 The Role of Social Interactions in the Cultural-Historical Theory

We have chosen Vygotski's cultural-historical theory as frame of reference to analyze the students' language practices during a debate on a SAQ. Social interactions play an important role in the process of cognitive development (Vygotski 1985): they allow the development of individual reasoning. While Vygotski acknowledged the importance of help from others, he nevertheless put the emphasis on the activity of the individual subject who appropriates knowledge and internalizes it:

> "Learning gives birth to, wakes up and activates in the child a whole series of internal development processes which at a given period, are only accessible to him through communication with the adult and collaboration with his peers, but which once they are internalized will become a conquest by the child himself" (Vygotski 1985, 112).
>
> Intellectual development is undoubtedly of a social nature both "because it is the product of the appropriation of psychological tools, of systems and of semiotic behavior constructed throughout human social and cultural history and because this appropriation can only exist in social communication and cooperation practices" (Rochex 1997, 128).

Vygotski considered that human action on their own behavior and on others' (and conversely others' action on one's own behavior) is mediated though systems of signs he called psychological tools: "language, the various forms of counting and calculation, mnemonic techniques, algebraic symbols, works of arts, writing, schemata, diagrams, maps and all possible signs, etc." (1985, 38).

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Many teaching activities in sciences are also characterized by the use of specific, culturally defined ways of using language as social modes of thought: Reasoning is fundamentally dialogical: the use of language as a cultural tool for collective reasoning could be expected to shape individual reasoning.

We have adopted a Vygotskian perspective of peer knowledge co-construction; that is to say, a social construction of thinking. The artificial or cultural development takes over from a first stage of development, considered as more natural in so far as it is not yet shaped by the tools of culture. In its cultural sense, development consists in the appropriation and internalization of the tools initially culturally constructed. In that case, intellectual development is considered as acculturation or progressive construction of a complex system of higher mental functions which are social (Dolz, Moro, Pollo 2002). For these authors the debate is a matrix of a specific type of communications and interactions and in the same time a tool for exploring opinions, deepening knowledge, building new significances and relevances, transforming attitudes, values and norms. The dialogical dimension of the verbal activity in Vygotski's theories leads us to consider the debate between students as a psychological tool allowing the construction of nanotechnologies SEI in the contemporary world and more widely the elaboration of the relationships existing between science and society. This is the basis for our analysis.

5 The Research Project and Protocol

We propose to link the didactic field of SAQ with the cultural-historical approach. According to Kantian epistemology, human beings tried to explain existing nature and the simplified models proposed were attempts to approach the reality while also maintaining the idea that the reality is inaccessible. As far as the technoscientific attitude is concerned, the model is used as real and the reasoning is indifferent to outside reality (Bensaude-Vincent 2009a). Therefore the aim of technosciences is no longer to explain nature but to observe the intervention of the researcher in the infinitesimal. Science is no longer considered as neutral (without human intervention) but as a cultural and social object (Beck 1986) which transforms itself and is passed on from generation to generation (Vygotski 1985).

For Vygotski, education was not only a telltale sign of natural development, it restructured psychic (higher mental) functions. The function of an educational action is therefore to mediate these tools, produced by culture, to transform them so that they can be learned. Any tool sets the proprieties of this or that language practice. Thus the debate participates in the transformation of values, beliefs, in the exploration and construction of knowledge, in the development of higher mental functions such as the abilities for arguing, resourcing in analogies, rephrasing, rebutting and speaking in public. We study the didactic transposition of a citizenship debate in social practices, in an oral formal genre which can be taught (Schneuwly, Dolz 1997). The debate at school is a textual genre. It "is always a controversial social problem for which diverse solutions are possible, but it is orientated towards the collective construction of a solution. It is a language tool for exploring opinion fields, for getting deeper insight into the knowledge needed for the construction of new meanings and the transformations of attitudes, values and norms" (Dolz et al. 2000, 44).

From the cultural-historical perspective we refer to, the initially external nature of complex cognitive activities is asserted. These psychic capacities preexist in the "products of culture" identifiable under the generic appellation of tools. These tools (historically created artificial means of action) refer to concepts, works of art, theoretical systems and also to "the specific means of

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transmission of cultural pre-constructs, namely educational means and systems" (Dolz et al. 2000, 39). Thus, children's learning depends on the internalization of these external tools via language practices with adults and with peers. Student verbal interactions in debates are therefore a media of learning (from the outside to the inside) and the mark of this learning.

The use of debates is a device for teaching SAQ, which are issues whose reference knowledge is discussed both in the scientific sphere, in the social and media sphere and in the school sphere when they are taught (Legardez, Simonneaux 2006).

We position ourselves within the frame of SAQ didactics concerning the analysis of students' socioscientific argumentation (the way they build, justify their opinions and conclusions as far as a socioscientific issue is concerned). More precisely we consider that peer social interactions play an important role in the construction of thinking. Our aim by referring to the Vygotskian frame is to question how, in a debate, students mobilize scientific, economic, ethical, political knowledge about the controversies related to nanotechnologies (SEI), and the way they collectively construct knowledge as well as social and civic competencies.

Let us present now our methodology and first the context of the experimentation.

We have chosen for this teaching a theme referred to a study on nanotechnologies and health carried out by the CNRS researchers, more particularly the study of a nanosystem for medical diagnosis. Lectures are based on several concepts of the curriculum which are involved in the design, fabrication and characterization of this biodetection nanosystem. After those classes, during practical sessions in laboratories, the high school students make and then use this biodetection nanosystem.

Table 1: Main steps in the experimentation of the teaching scheme

Class	Scientific Senior year
Nature of project	(1) Courses given by young researchers dealing with concepts of the secondary-school final-year program are presented under an interdisciplinary perspective and are called up for the nanotechnology project of that class (20 hours in high-school); (2) A practical experiment conducted in the frame of a laboratory, close to the current scientific practices (6 hours); (3) Organization of debates to encourage a reflection to face the uncertainties related to technosciences and their impact on society (14 hours).
Disciplines involved	Physics-chemistry, Biology, philosophy, English, history-geography, Civic, Legal and Social Education.
Time duration	6 months (40 hours) from September to March

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From the perspective of nanotechnologies, the knowledge lies both in the method of fabrication of this molecular diffraction network (soft lithography), in the specific interaction between biomolecules and in detection sensitivity which closely depends on the size of the molecular patterns of the network (here nanometric sizes). In Physics class, the contents concern the diffraction of light. The way light behaves in front of an obstacle, a slit or a thread is taught in a scientific senior year. The way light behaves in front of a molecular network simplified by a series of equidistant slits is taught in the experimental Scientific Senior year with special courses in nanotechnologies. In Mathematics class, the contents concern the modelization of diffraction, in particular with the functions $\sin x / x$, et $(\sin x / x)^2$. It is necessary to plan and simulate through calculation the variations of the light intensity diffracted by the detection device during the immunological test. The calculation provides information on the sensitivity of the device and thus on its potential interest for medicine. Consequently Mathematics is more likely to appear in the students' eyes as a necessary school subject for the modelization and predictability of scientific phenomena. In Chemistry class, the contents concern the organic materials and their specific properties. The fabrication process implemented during the experiments uses an elastomer polymer and requires the preparation of glass surfaces, treated with chemical molecules allowing for the adherence of proteins. In Life Sciences class, the contents concern the antigen/antibody reaction as well as the biological tests of ELISA detection (Enzyme-Linked Immunosorbent Assay for the detection of antibodies) and the Western Blot (for the detection of viral proteins): AIDS is the example studied in a Scientific Senior class. The study of the functioning of the nanosystem mobilizes the knowledge which has been acquired during the lesson and enables its comparison with the other immunological techniques previously studied.

Analysis of argumentation is widely used in the field of science education (Sadler 2004; Simonneaux, Legardez 2011) where the students are generally invited to debate and handle an argumentation in class on SSI. Often, debates are deliberative: they lead to decision making. In our case it is a debate whose objective is to mobilize and confront ideas, facts, information by favoring the expression of different viewpoints. The interactive phase of the debate is preceded by a preparation phase.

The students use a documentary file prepared by the researchers. The file is composed of a selection of quotes from scientific publications, philosophical documents, French and international contemporary ethical reports, press articles, articles from associations opposed to nanotechnologies. The documents deal with 4 topics: health, enhanced human, environmental and fail-safe risks, control and individual freedom. It allows a first approach to encourage students to deepen their reflection with personal researches. They meet successively two specialists (a philosopher, and a geneticist) and address them the questions arisen from this first approach during one hour. The specialists are researchers whose research activities deal respectively with genetics and science ethics and with nanotechnology ethics.

Then a debate took place during regular courses in the standard class. The students discussed the SAQ collectively selected: "Do we have enough control over nanotechnologies to modify the human being, and do we have the right to do so?" The debate moderator is the History-Geography teacher. Fifteen students (17- to 18 years-old) took the floor during this one-hour discussion.

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6 Methodology for Analyzing the Verbal Interactions and Results

We proceeded to classify and to analyze thematically the arguments, based on their contents (Bardin 2001). In other words, the thematic categories are not given *a priori*, and are revealed by spotting of keywords a posteriori. This needed to take in account the speaking turns.

In our view, the modalizations are crucial hints in so far as they allow to spot the students' involvement in their utterances. A modalizer is a word or group of words which express the opinion, the attitude or the feeling of the speaker towards his/her own speech. We consider them as valuable parameters to sense the involvement of high school students, in other words to measure the degree of adhesion or doubt of the subject towards his own arguments. These modalizers consist in adjectives (sure, certain, clear, evident, doubtful, uncertain, probable, possible...), adverbs (eventually, certainly, necessarily, really, undeniably, obviously, likely, maybe, probably ...), modals (should, would, might, could, may), verbs (to claim, to assert, to certify, to admit, to think, to believe, to suppose, to wish, to hope ...), impersonal forms (it is sure that, it is clear that ...).

We chose to use the categorizations developed in a Vygotskian perspective by Mercer (1995) from the analysis of linguistic interactions between students. This approach established connections between the utterances by placing the exchanges in the dynamics of the debate between students. Mercer (1995) elaborated the definition of three kinds of talk representative of "social mode of thinking". He distinguished the following three types of discourses: disputational, cumulative and exploratory talk.

- Disputational talk, where characteristic discourse features are short exchanges consisting of claims and challenges or counter-claims. The relationship is competitive, differences of opinion are stressed rather than resolved, and the general orientation is defensive. Speakers defend their own selves and the most relevant point is to disagree.
- Cumulative talk, where characteristic features are repetitions, confirmations and elaborations. Ideas and information are shared, and joint decisions may be reached, but there is little in the way of challenge, or constructive conflict, in the process of constructing knowledge.
- Exploratory talk, during which speakers engage in critical but constructive discussion about each other's ideas; when challenges are made, they are backed up with argument and alternative viewpoints are suggested. Compared with the other two types, knowledge is made more publicly accountable, and reasoning is more visible in the talk. Students oppose but they provide justifications.

The analysis of the knowledge at stake in the dialogical exchanges focused firstly on the themes discussed and on the archetypal narratives. The identification of speaking turns ensures the exclusive character of the categories brought to light. Thus, a clause can only belong to one category (Bardin 2001). The results show a high level of inter-observer agreement (87 % agreement between the three observers). We present in table 2 an example of speaking turns for each theme addressed. The themes highlighted are the keywords which allowed the classification of the clause in the category.

The use of nanotechnologies for the modification of the human body in view of a healing is valued: "healing I don't see why we should be against it because it is finally a goal to heal a person who suffers from a disease" (Thierry, 73). Lifetime extension and drug delivery appear like positive advances. Nevertheless, the question of body improvement divides. Some are in favor: "of course we have the right to modify the human body we don't have to consider the human body like a taboo object which we don't have the right to touch" (Penelope, 5) in

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keeping with the National Science Foundation (NSF) report (2009, 30) discussing rights and obligations "Is there a right to be enhanced?" To others, the fears and toxicity of nanoparticles prevail: "I think finally if we directly put nanoparticles for (inaudible) leaving them there knowing that for the moment we don't know much that is a problem (...) we cannot say from now on hey let's modify the body and we will see what happens (Claire, 54). Indeed nanoparticles adopt new types of behaviour by easily diffusing in the human body and by crossing the biological barriers like the hematoencephalic barrier or the placental barrier, which traditionally ensure the protection of the vital parts of the human body (Benoit-Browaeys *et al*. 2010, 14). Another form of risk is the temptation of demiurge. Nanotechnologies are perceived as providing the omnipotence which characterizes God: "we consider a little ourselves like God" (Joel, 25). In his reference to God, Joel expresses the accomplishment of the Promethean myth at the risk of destroying humanity. The students draft arguments on the vagueness of the boundaries between nature and artifact (Bensaude-Vincent 2009a, b) by evoking the fact that nanotechnologies permit the access to the elementary bricks of living, the atoms.

Table 2: Themes discussed by the students in the debate

Themes addressed	Total of turns of speech	Examples of turns of speech
Enhancement of the human body	25	5. Pénélope: I think that well yes we have the right inasmuch as it is going *to improve* a little the *life of the people who have problems who are disabled* or even without being disabled it is going *to allow improving the performances to improve his life* of course we have the right to modify the human body we don't have to consider the human body like a *taboo object* er which we don't have the right to touch
Dangerous effects of nano-technologies	19	59. Thibaud: in the file there was an article which dealt with a household product with nanotechnologies and we saddled with 40 users straight *at hospital* because it had nanotechnologies in the lungs we don't control technologies already to *protect the human being*
Scientific experimentation	14	11. Nathan: what has to be said is that it cannot be commercialized from the beginning but that er we can *test* it on a human being to see what it does but of course er we are not going to commercialize directly something we don't know the consequences but er to find the consequences there is a need to er at the beginning more or less in quotation marks er *guinea pigs*
Benefit for all progress of nano and science	8	50. Nelly: In any case what has been to modify the human body it has to be known that if we come to er something that can be beneficial er it will be beneficial anyway *to the largest number possible*
Law, control	6	93. Nathan: we also have the drug-taking which modifies the functions of the organism so nanotechnologies should be er *regulated* like other products and er and make *a law* that is why there has to be a *regulation*

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They state that a human is not only a body but a psyche as well and evoke the implants that can modify the human body's functions and be assimilated by the living itself. This type of argumentation dealing with the dangers of human body's modification testifies to the values involved and the objectivity taken with respect to these new technologies. The students set up a difference between healing and enhancing, the first desirable and the second undesirable. Healing lies in a necessity order, for the well-being of humanity, whereas enhancement appears as accessory. Regarding good life, the question is raised: will enhanced people be happier, and if not, why bother with enhancement? (NSF 2009). The uncertainties, the introduction of nanoparticles inside the human body, the irreducibility of the human being, endowed with psyche to an organism composed of atoms, the loss of free choices are mentioned. The enhancement of human capacities, central issue of convergence retrieved by transhumanists and extropians, is subject of acute controversies (Bensaude-Vincent 2009a; Larrère 2008; Schummer 2009; NSF 2009). But students do not evoke during the debate the theme of transhumanism or post-humanity. They explore the question about the limit between nature and artifact (Bensaude-Vincent 2009a) in the health and military fields (NSF 2009).

The question of the harmful effects of nanotechnologies is articulated around the approval/disapproval couple. Some students point at the noxiousness of nanotechnologies. Thus, for Serge (73), "there is a need to do the necessary research to avoid the noxious effects you are talking about". The vocabulary is slighting: "noxious, risks, drifts, dangerous, detrimental". Conversely, others consider we are worrying for nothing: "I think that there is no need to be paranoid with respect to nanotechnologies" (Penelope 109). This optimism is related to a great confidence in science such as Serge who thinks that: "research will tell [the positive or negative consequences of nanotechnologies]" (Serge, 105). If students are worried about the lack of information, they do not necessarily mention the idea of stopping scientific research on nanotechnologies. But they share the idea that nanotechnologies "intrinsically set a serious problem of ethics: how far do we have the right to go?" In the same way, most participants in a Swiss citizen panel expressed hopes regarding the potential benefits these emerging technologies might bring in the future, while at the same time expressing concerns for the possible risks they might imply (Burri 2009).

"Modifying the human body I know it is a responsibility (...) if we put the nanoparticles directly inside the body what effect will that have I mean?" (Claire 68). Indeed, the modification can be irreversible and affect the entire human kind. The students discussion on the risks and detrimental effects echoes the stand taken by researchers (Académie de technologies 2009; Marano, Lahmani, Houdy 2010) and by environmental associations who believe that the sanitary and environmental risks are neglected and the studies on these risks incomplete. In respect of the precautionary principle, these associations propose a moratorium on research on nanotechnologies and on their commercialization.

The concept of scientific and technological mastery reflects an expression of a quasi-absolute confidence in science and in a scientist representation of its progress. The students identify the tests and experimentations as a need for science allowing it to progress: "there is a need to er at the beginning more or less in quotation marks er guinea pigs" (Nathan, 11). The idea of an eventual moratorium is rejected in the name of the scientific progress: "techniques need to be developed (...) so starting from that point there is a need to continue the experiments and researches and above all: do not stop!" (Nelly, 39). Here, the clauses are marked by the use of "there is a need to" and sometimes modulated by the auxiliary "do". The utterances are injunctive and prescriptive. The use of

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concessions ("even if", "in that case", "then"), the introductory verbs "I think" and "there is a need to", and more widely speaking the density of modal items (clearly, even, absolutely, we can say...) mark an argumentation dominated by affirmations centered on scientism. This discussion stands apart from the ethical questions related to nanotechnologies (SEI) but testifies to the preoccupations of teenagers enrolled in scientific scholarships who take advantage of this debate on nanotechnologies to argue their general conceptions about the construction of science.

The students describe a difference in the access to scientific discoveries and innovations: "when we make a discovery it is compulsory at the beginning it is the wealthy countries that take advantage of it" (Léo, 34). It concerns the social categories and the inequality between wealthy countries and emerging countries (Lewenstein 2005; Mnyusiwalla, Daar, Singer 2003; Sandler 2009). The prescriptive formulas such as "they have to be given to everyone" (Thibaud, 38) and the confident forecasts ("it will benefit anyway the largest number possible" Nelly, 50) tend to foresee the reduction of the disparities and the democratization of the benefits related to nanotechnologies. The will to avoid ratifying to a rupture between richer and less rich people can be spotted, beyond the modal items (it would better, cannot), and the use of verbs emphasizing the recourse to standards (limit, control). Everyone's access to nanotechnologies and science progress is a teenagers' concern, revealing values of sharing and altruism. The view that the development of nanotechnologies will be a "factor in widening the gap between countries in the North and in the South" (Commission Nationale du Débat Public, CNDP 2010a, 6) is reflected in the criticisms of these technologies identified in the public debate. In the report commissioned by the French development agency, this preoccupation appears clearly through references to the benefits to be shared in an inclusive society and to the exposition of the populations to the sanitary and environmental risks. (Benoit Browaeys et al. 2010). The dialogical exchanges about everyone's access to nanotechnologies, about the dialectics between healing and enhancing, about the individual liberty, about the physical integrity etc. convey values like respect, justice, equity, sharing, honesty, solidarity even if they are never explicitly named by the students.

The need for a regulation is exclusively claimed by male students: "yes we must proceed to a draconian control of nanotechnologies research" (Serge, 122). These normative comments reflect however a sense of powerlessness to impose that control: "there's a need to control but we will never be able to control there will always be people" (Joel 95). The students debated on a key question discussed at length during the public debate, that of the governance of nanotechnologies, in particular, an "open and responsible governance covering everything; regulatory issues on a national and also European level (...) setting up a real partnership between science, research and society" (CNDP 2010a, 11). This governance is considered to be "modern" by the "civil society", the key words being transparency, participation and shared responsibility (CNDP 2010b, 106).

The five themes explored by the students can, in our opinion, refer back to the "arche" stories described in the European research program DEEPEN (Deepening Ethical Engagement and Participation in Emerging Nanotechnologies). The DEEPEN programme identifies five "narratives" that influence responses about nanotechnologies: (1) Messing with Nature (The Sacred;); (2) Opening Pandora's box (Evil); (3) Be careful what you wish for (Desire); (4) Kept in the dark (Alienation); (5) The rich get richer, the poor get poorer (Exploitation). The DEEPEN program drew inspiration from the concept of "master narrative" developed by Heller (cited by Dupuy 2010).

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The first three – the Sacred, Evil, Desire – refer to the cultural heritage from Antiquity, the last two - Alienation, Exploitation – to modern heritage: these "arche" stories are "the deeply embedded cultural resources which lay-people use to discuss the ethics of nanotechnology" (Dupuy 2010, 154). The first narrative proposes that one should not interfere with the relationships existing between nature and human beings. The theme "Enhancement of the human body" refers to the risk of all-powerfulness of the sorcerer's apprentice who manipulates the living and to the desirable artificialization (healing) or to the undesirable artificialization (enhancement).

Pandora's Box was a tempting box which when opened released all human evils. This narrative incorporates the ideas of power, uncertainty, pride, and finally disaster. It identifies the risks, uncertainties and unforeseen dangers of technologies that are regarded as inevitable and produced by proud and arrogant science that manipulates while not yet completely understood. This narrative appears when the noxious effects of nanotechnologies, which one should be suspicious of, are discussed.

The narrative "Be careful what you wish for" refers to the ideas of perfectibility and of desirability. This narrative warns the reader that he should beware of the seductive promises of nanotechnology because getting exactly what you want may ultimately not be good for you and letting yourself be seduced by these temptations could have harmful consequences. This narrative can be read between the lines in the students' statements in so far as they reveal how confident they are in science and its progress when they discuss tests and scientific experiments.

In the narrative "Kept in the dark" people are convinced they are not informed of current and potential technologies and feel they have little impact on their development. This narrative weaves together a whole range of ideas about control and power, combined with modern alienation towards secret and inaccessible institutions such as government, corporations and the military, with their questionable motives of power, interest, and money. If the theory of a technosciences conspiracy is absent from this debate, the question of the uncertainties linked to the development of nanotechnologies and of the necessity of a sometimes illusory control is examined.

With the last narrative, the ideal of democratization of the access to nanotechnologies mentioned by students can be spotted. In this narrative the rich get richer and the poor get poorer; the promises of green or socially interesting technologies serve to hide the profits of the rich. In this narrative the ideals of justice and equality are used to criticize the potential development of nanotechnology.

The archetypal narratives structuring lay-people's representations about nanotechnologies enable us to account for the knowledge learnt by the students in the debate. We can then point out the talk categories and the co-construction of the social ethical issues concerning nanotechnologies.

Three out of the four themes developed by students apply to SEI related to nanotechnologies. We propose a new analysis of these themes.

We have categorized the students' interactions in the debate according to Mercer's methodology (1995), identifying three talk categories: disputational (DT), cumulative (CT) and exploratory talk (ET). We obtain an inter-observer agreement of 81 % between three observers.

These categories enable us to account for the dynamics of the exchanges (see table 3).

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Table 3: continuous excerpts of the debate showing alternating cumulative and exploratory talk about the dangerous effects of nanotechnologies.

105 Joel: We've been talking about organisms for a while, but we should ask other questions: will it have positive or negative consequences, only the future will tell. (CT)
106 Serge: research will tell. (CT)
107 Penelope: When you're saying people can choose in all honesty what they want to do, but if we are not aware of the consequences, if even it's impossible for them to know what's going to happen, can they really choose by themselves if they can't foresee the consequences, we might as well play.. (inaudible). (ET)
108 Bruno: The negative side of nanotechnologies, it flies around everywhere in the air, we breathe it in, there will be serious problems with lungs and the brain. (CT)
109 Penelope: I think that there's no need to be paranoid with respect to nanotechnologies, all the same we breathe in molecules every day, molecules, bacteria, and all that...they are not..., they're not necessarily dangerous, it's not because we're going to modify the human body that there's going to be things that are going to go everywhere, which are going to kill us. (ET)
110 Teacher: Two or three more questions.
111 Octave: For the time being there is no question of making self-replicating particles like viruses, the question does not even arise to know if we could be infected. (ET)
112 Caroline: I don't see why you're talking about viruses, just think, there are nanoparticles in exhaust pipes and we breathe them in every day and then they're in your body, they're not alive and they're everywhere, and they have negative impact on your body. (ET)
113 Joel: In relation to what you said.., in relation to what you said about viruses and all that, if we implant nanotechnologies inside the body, would it be possible, well, er.. from what we saw in biology, we saw that life always adapts, so would nanotechnology not be able to adapt to this technology and create even more dangerous things ? (ET)
114 Nathan: In relation to what Clément said about exhaust pipes, this morning how did you get here ? You came by bus, and on the bus there's an exhaust pipe as well, so you too are contributing in some way, if you're against, in that case. (inaudible) (DT)
115 Teacher: We're about to conclude, Nathan
116 Nathan: And what's more with or without particles exhaust pipes are bad for the organism. (CT)
117 Thibaud: Let's just have a look at the set of documents, the product they marketed was harmful, I don't remember if it was some washing powder? (CT)
118 Nathan: The detergent, it was not self-replicating like the virus, it does not have to be a virus, er.., to be made in order to be harmful to users, there's no need..er.. and they do not know if it is..., they have not conducted enough studies on that (CT).

Most studies show that by analyzing the language of students during classroom debates there is mainly disputational and cumulative talk (Mercer 1995). This is not the case here and we observed few conflicts between students. Given the length of the protocol and preliminary work on documents and the preparation made during the expert meetings with the group of students, we believe that the effect of experimental group membership reduced such conflicts and that a microsocialization has occurred between these students. Instead of

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conflicts within each group, we observed cumulative talk and less often exploratory talk.

We notice in table 4 that two themes contain exclusively cumulative talk: "Benefit for all" and "Law and control". The students explore the SEI field by juxtaposing the types of talk.

Thus, the first six students' speaking turns highlight the question of the gap between rich countries and poor countries, but end up specifying that any innovation will inevitably democratize in the long term. They proceed by analogy with the case of television: "when a discovery is made, inevitably in the beginning rich countries take advantage of it, even without talking about the countries, a small part; for example, television. In the beginning when it was discovered not everybody had a TV set whereas now everybody has one (Léo, 34, CT). Nevertheless information provided in the debate is accepted without evaluating. These pieces of information are rephrased or repeated without being examined in more detail and without any challenging by the students. Similarly, the students all agree on the fact that research on nanotechnologies must be controlled: "Yes, research on nanotechnology must be strictly controlled" (Serge, 122, CT). However, the students neither specify the feasibility of the control nor the responsibilities involved. There is no critical distance in relation to the statements but just an evocation of the necessity of a control over research activities.

Table 4: Number of types of talk according to Mercer's categories

Theme	Total of turns of speech	Type of talk
Enhancement of the human body	25	DT : 2 CT : 16 ET : 7
Dangerous effects of nanotechnologies	19	DT : 2 CT : 9 ET : 8
Scientific experimentation	14	DT : 0 CT : 7 ET : 7
Benefit for all	8	DT : 0 CT : 8 ET : 0
Law and control	6	DT : 0 CT : 6 ET : 0

The association of cumulative talk and exploratory talk allows the students to investigate the field of the dangers linked to nanotechnologies and that of human nature. The cumulative talk underlines different aspects of toxicity linked to nanotechnologies such as still unknown noxious effects, in particular on health, needs to protect the human being, pollution, noxiousness:

> "I agree with what says. There are no long term studies on nanos. For example we know that nanotubes, we all know that it is somewhat like asbestos. We do not know what effects they're going to have on the human body" (Tom, 42, CT).

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The exploratory talk enables the networking of these different aspects of nanotechnologies' toxicity:

> "With the products using nanoparticles noxious effects have been noticed in particular on lungs on the brain and if we put nanoparticles directly into the body what effect is it going to have, then?" (Caroline, 71, ET).

Therefore, this co-construction of the concept of toxicity allows the students to point to the weaknesses of research in the field of toxicity: "We have to do research to avoid the noxious effects you're talking about" (Serge, 73, ET). As the question of the breaking through the hematoencephalic barriers by nanoparticles is being explored, two groups of students oppose each other, one group pointing to the dangers of nanotechnologies and the other relativizing them.

This relativisation of dangers is supported in the group by various arguments. Nanoparticles exist in nature; the capacity of self-replication of the nanorobots and their emancipation from human control in Drexler's notes[2] are laughed at: "for the time being there is no question of making self-replicating nanoparticles" (Octave, 111, ET). Similarly in the other group, in reply to this relativization, arguments are developed referring to a warning about the dangers that nanometric implants may represent in view of the adaptability of the living: "from what we saw in biology we saw that life always adapts, so would nanotechnology not be able to adapt and create even more dangerous things?" (Joel, 113, ET). He draws an analogy with the AIDS virus: "remember, the aids virus for example, it adapts to any situation... If we keep on developing nanotechnology in 300 years what will they do?" (Joel, 125, ET). Therefore, the fantasies conveyed about nanotechnologies are brought to light in the confrontation via interaction.

The cumulative talk underlines different sides of the human being's nature linked to nanotechnologies like the enhancement of the human body in the medical field, the toxicity of medical repairs, the interest of healing through nanomedicine, of analogy between body modifications and aesthetic surgery.

These three speaking turns express non justified exchange of opinions, that is to say cumulative talk.

90 Serge: "I'd like to react to what Caroline said, it means that today all those who have their lips or buttocks redone, it's useful for their organic development, it's the same?"

91 Caroline: "No, that's a modification but er... it's different."

92 Serge: "It's not useful."

The exploratory talk allows the networking of these different aspects of human nature whose very foundations can be called into question by the advent of nanotechnologies: drug vectorization, artificialization of the living being, modification of functions. The dialogical interactions on the question of the modification and on enhancement allow the students to distinguish what has to do with repairing a failing function from what has to do with adding capacities to a human being: "Healing, I don't see why we should be against it because the aim is to heal a person suffering from a disease, but concerning the modification

[2] In his book Engines of Creation (1986), Eric Drexler describes self replicating nano-objects capable to produce rapidly by self-assembly processes massive quantity of nano-entities.

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of the human body then you need to have a goal for nanotechnologies" (Thierry, 73, ET).

The question of the introduction of nanodrugs in the human body and of their hypothetical side effects in the long term divides the students. In these exchanges feeding the dialectic, we identify both cumulative talk (rephrasing, utterances without justification) and exploratory talk (justified arguments, justified questionings, evidence giving). Some only take the advantages of repairing into account and express their confidence in the technological feasibility: "I think that healing human beings thanks to nanotechnologies is something we master, scientists and doctors will act in order to achieve that" (Bruno, 56, CT). Again, analogies between medicine and aesthetic surgery support their arguments: "the human body, we've already modified it, for example with a battery in the heart" (Nathan, 85, CT). Others express their mistrust by exposing the risks of modifying functions: "the implants (breast implants) she gets, it has no interactions with her body, it only changes appearances there, whereas here with nanotechnologies functions can be changed" (Caroline, 93, ET). The interactions on the implants lead to questions on the artificialization of the human being and on the nature of man ranging from a cyborg-soldier to a body without a psyche: "True we can modify things for handicaps, but we can create soldiers who fear nothing" (Joel, 26, ET). "There's something which bothers me, we've been talking for a while of modifying the human being, there's something wrong, it's the word human being modifying the human being, that is to say that in the word being there's also the psyche" (Joel, 88, ET). To back up their arguments, the students have recourse to knowledge assimilated during the meetings with the experts: "as the researcher said the other day when we know how to create a cell from all parts" (Nathan, 26, ET).

We show (as Mercer 1995 does) that cumulative talk involves providing information, rephrasing and reflects the cohesion of the group and that the challenges, the oppositions in the exploratory talk serve knowledge co-construction in the context of a reflexive communication. Although exploratory talk is of course richer from an argumentative point of view, it feeds as well on cumulative talk. Therefore we'd like to emphasize their complementarity in relation to the argument construction shared by the group in this debate. We notice that the networking of the characteristics related to the concept of toxicity allows the students to create a system around that network, supported by the recourse to analogies. The importance of the use of analogies was stressed by Burri (2009) asserting that "citizen panel complied with uncertainty by using analogies." This co-construction of the concept leads them to highlight the weaknesses of toxicological studies research as well as the health effects of nanoparticles because of their small size and their capacity of interacting with the living. The networking of the properties of human nature allowed the co-construction of the possible calling into question of human nature by nanotechnologies. However, this joint construction does not have them fall into transhumanist deviations.

One of the functions of language, according to Vygostski (1985), is to enable learners to organize their own thoughts and give meaning to words. Indeed, Mercer (1995) states that we use language to transform our thinking through individual thought and collective action. This author argues that language can actually facilitate learning when it is used mainly as exploratory talk. Culture creates external auxiliary devices (tools, devices, technologies) which support the psychological processes. Language (cultural tool) interacts with thought and gives birth to new functions, it is in this sense that having tools created by

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culture (here the debate) available to students allows them to increase greatly their natural capacities and to restructure their higher mental functions. By appropriating the cultural tool, they train themselves as citizens in the practice of the debate in democratic life and they acquire new knowledge on the SEI. The role of school is here to have the students interact with the cultural tools: debates and SEI.

Conclusion: Towards Educating for Citizenship

At the end of this experiment, a high level of knowledge was observed among these high school students as they used nanotechnology notions to illustrate their ideas. And their level of reasoning equalled or exceeded that of some of the lay adults who had participated in the French public debate as shown above, including an awareness of SEI specific to nanotechnology.

The strategy tested in this educational innovation appears to be relevant for teaching science-society interactions in high-school education and, in particular, the role of technoscience in society. We have shown that nanotechnologies are particularly well-adapted to that educational issue including science lectures and social ethical reflection. We assert as Simonneaux, Legardez (2011) does that there is complementarity between SAQ and the taking into account of values.

From a Vygotskian perspective of social construction of thought, our results show that the students construct knowledge concerning the science-society interactions, and more particularly the nanotechnologies-society interactions. The knowledge learnt by the students – enhancement of the human body, dangerous effects of nanotechnologies, scientific experimentation, benefit for all progress of nano and science, law – can refer back to the archetypal narratives whose origin lies in men's social and cultural history. These narratives preexist the students as external entities created full of socially and historically elaborated significations, they are deeply rooted in European culture and passed on from generation to generation. In that sense, they are psychological tools for the individual subject because their origin lies in men's social and cultural history and because each one of us can only appropriate them through activities conducted through interaction with others.

The whole of the cumulative talk, when in sufficient quantity, as in the most talked about themes, enables students to lay the basis for a confrontation of viewpoints, the expression of oppositions and deepening the knowledge concerning the controversies related to nanotechnologies. In that sense, it can be said that through the joint effect of cumulative talk and exploratory talk, the students co-construct the concepts linked to the SEI. The peer-to-peer debate, as a social construction of knowledge, thus plays its heuristic and exploratory role. Therefore, the results confirm that debate, in SAQ teaching context, is a pertinent operation to sensitize students to the ethical issues of nanotechnologies and prepare them to their role of citizens to interrogate a thoughtful and reasonable development of nanotechnologies (Sandler 2009).

Indeed nanotechnologies can be found in numerous application fields and are simultaneously developed in research laboratories. The critical apprehension of their current and potential uses lies within a highly prospective perspective. The objective of citizenship education to nanotechnologies in the sense of responsible citizenship education is to train the citizens to reflect on the present and future issues of the world we live in when they are at school.

This citizenship education does not have a moral dimension in the sense of an *ex cathedra* teaching of values but rather in the sense of questioning values. In this debate, concepts like dignity or liberty are not first and foremost but instead they are implicated in everyday situations by the development of

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nanotechnologies. The citizenship education we stand for is characterized by its social dimension in a global society, marked by issues on a local and world scale where the citizen must be able to know how to analyze the issues, to take stand and to make choices as an individual actor, a social and economic actor as well as a citizen from a State. This citizenship education also takes into account the political dimension in a democratic society marked by discourses on the development of ethical responsibility and marked by the involvement of citizens in the exercise of power in the respect of equality of rights (Audigier 2000).

This manner of understanding citizenship and citizenship education is consistent with our conception of social construction of the individual subject and of their learning. Indeed, we understand the citizen from a Vygotskian perspective; that is to say, by considering human social being as a product from culture. Thus, the intellectual activities (comparison, cause, definition, explanation, justification...) require the engagement by an individual subject socially situated in cognitive and symbolic constructions, which are made possible by the mediation of interactions with others. The psychological tools at play in the debate (comparison, definition, archetypal narratives...) are inherited from culture and represent the foundation of critical thinking (Vygotski 1985).

Confronted with issues involving the development of nanotechnologies raising dilemmas, the students must acquire analysis tools enabling them to understand complex systems encompassing the debated issues. Therefore the role of citizenship education is to pass on some heritage and to teach the ethical principles and the legal frames (national and international) which characterize the act of living together. This means also that educating for citizenship include presently developing a scientific citizenship linking up scientific, technical and ethical knowledge.

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List of Abbreviations

CNDP: Commission Nationale du Débat Public

CNRS: Centre National de la Recherche Scientifique

CT: Cumulative Talk

DEEPEN: Deepening Ethical Engagement and Participation in Emerging Nanotechnologies

DT: Disputational Talk

ET: Explorary Talk

ELISA: Enzyme-linked Immunosorbent assay for the detection of antibodies

EESD: Environmental Education for Sustainable Development

ELSI: Ethical Legal Social Impacts

SAQ: Socially Acute Questions

SEI: Social Ethical Issues

SSI: Socio Scientific Issues

NBIC: Nanotechnology, Biotechnology, Information Technology and Cognitive Science

NSF: National Science Foundation

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Call for Papers

Call for Papers

The 9th CitizED international Conference

"East and West in Citizenship Education: Encounters in Education for Diversity and Democracy"

July 13-15, 2013
Tokyo, Japan

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and
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The International Conference "East and West in Citizenship Education: Encounters in Education for Diversity and Democracy" will focus on encounters between 'East' and 'West' in citizenship education from a comparative perspective. Proposals that explore matters from qualitative and/or quantitative studies are welcome.
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