ForumSprache

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Impressum ForumSprache

Die Online-Zeitschrift für Fremdsprachenforschung und Fremdsprachenunterricht
Schriftleitung:
Prof. Dr. Friederike Klippel
Prof. Dr. Gudrun Ziegler

Herausgeber-Gremium:
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im Hueber Verlag GmbH & Co. KG, Ismaning

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Gestaltung: Sarah-Vanessa Schäfer
Produktmanagement: Astrid Hansen

ISSN 1868-0852
Artikel – ISBN 978-3-19-476100-1
aus Ausgabe 05 / 2011 ISBN 978-3-19-436100-3
3. Jahrgang, No 1, 2011

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The development of initial teacher education focusing on multilingualisms: the innovative approach of Luxembourg

Charles Max

Abstracts

This paper provides an overview of the innovative initial teacher education program 'Bachelor en Sciences de l'Education', which was launched in 2005 at the University of Luxembourg.

Facing the challenges of a traditional multilingual curriculum, Luxembourg's teaching professionals are facing multiple multilingualisms on a daily basis, stemming from diversified media-input, migration, commuting of parents and/or children and the divergent values attributed to languages within the national context.

Therefore, teachers (in focus here: pre-primary, primary, lower secondary level) need to develop concepts, skills and tools for dealing with the realities of language and the learning of languages from a language integrated perspective.

The paper presents the transdisciplinary architecture of the supportive and challenging initial teacher education (ITE) learning culture, i.e. the cultural-historical and sociocultural frameworks of the collaborative study approach and the innovative spaces for dialogue, meaning making and learning across boundaries. First hand experiences from the implementation of the program will elucidate horizontal forms of learning in a specific multilingual and multimodal 'learning-for-teaching' activity.

La création et la mise en œuvre d'une formation initiale cohérente des enseignant-e-s intégrant les multilinguismes : l'approche innovante du Luxembourg

L'article donne un aperçu général du 'Bachelor en Sciences de l'Education', cursus innovant de formation initiale des enseignant-e-s (FIE) créé en 2005 à l'Université du Luxembourg. Face aux défis du curriculum traditionnel trilingue du Grand Duché du Luxembourg, les enseignant-e-s sont confronté-e-s aux différents multilinguismes du pays, créés par l'exposition aux supports médiatiques divers du quotidien, les processus de migration et de mobilité, la situation sociogéographique, et marqués par les valeurs divergentes attachées aux différentes langues dans le contexte national. Ainsi, les professionnel-le-s de l'enseignement (ici : enseignant-e-s du pré-primaire, primaire et secondaire inférieur) doivent développer des concepts, des pratiques et des instruments pour faire face aux réalités langagières et à l'apprentissage des langues dans une perspective intégrative. La culture d'apprentissage transdisciplinaire du programme sera présentée sous ses aspects stimulateurs et d'entre-aide mutuelle. Les approches historico- et socioculturelles à la base de l'approche d'études collaborative seront présentées ainsi que la mise en place d'espaces innovateurs stimulant le dialogue, la construction de sens et les apprentissages au delà des frontières conventionnelles. L'article donnera accès aux expériences réalisées en discutant des formes d'apprentissage horizontal, réalisées dans le cadre d'une activité de formation à caractère multilingue et multimodal.

Entwicklung und Umsetzung eines mehrsprachig kohärenten Studienprogramms in der Erstausbildung von Lehrkräften: der innovative Ansatz Luxemburgs

Der Beitrag stellt die innovative Lehrerausbildung 'Bachelor en Sciences de l'Education' vor, die 2005 an der Universität Luxemburg eingerichtet wurde. Mit den Herausforderungen der traditionell mehrsprachigen Lehrplänen der Schulen in Luxemburg befasst, sind Lehrkräfte darüber hinaus mit den verschiedenen Figurationen von Mehrsprachigkeit konfrontiert, wie sie sich durch breite Mediennutzung,

Arbeitsmigration und Mobilität sowie bereichsspezifische Sprachennutzung und entsprechende Wahrnehmung durch die Öffentlichkeit abzeichnet. Lehrkräfte müssen daher über Konzepte, Fertigkeiten sowie Arbeitsinstrumente verfügen, die ihnen erlauben, mit mehrsprachigen Realitäten der Lerner umzugehen, sowie Sprachunterricht jenseits der Fächergrenzen zu integrieren. Der Beitrag stellt die transdisziplinäre Architektur der unterstützenden und fordernden akademischen Lernkultur vor, d.h. die kultur-historische bzw. soziokulturelle Basis des kollaborativen Studienansatzes und die Gestaltung innovativer Räume zur Förderung von Dialog, Sinnbildung und Lernen über konventionelle Grenzen hinaus. Der Beitrag diskutiert Erfahrungen aus der lehrerbildenden Praxis am Beispiel von Formen horizontalen Lernens in einer multilingual und multimodal ausgerichteten Aktivität „Lernen-fürs-Lehren".

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The context: Sociocultural research and the beginning of the university

The initiation of the University of Luxembourg in 2003 convened the teaching staff of the existing teacher training programs in the new Faculty of language and literature, humanities, arts and educational sciences (FLSHASE). The creation of this academic institution compelled the scholars to adapt academic programs to suit the novel standards for higher education, i.e. develop academic programs with a modular structure according to the European Credit Transfer and Accumulation System (ECTS), as initiated by the ongoing European-wide Bologna Process. Especially primary school teacher training needed to be profoundly transformed as it moved from a college-based to a university-based academic program as a response to the recent societal, educational, and school-related changes in the country.

The construction process of the innovative Bachelor in Educational Sciences program (BScE) is the research context of the present study. The professionally oriented, eight-semester BA program of 240 ECTS credits was launched in 2005 as a major section of the newly created University. It aims to educate teachers dealing with the changing demands of a prevalent multilingual and multicultural population.

This paper outlines to what extent sociocultural views on human knowing, learning and acting in the legacy of Vygotsky's work might mediate the development of an initial education program for primary school teachers. More specifically, it explores the potential contribution of cultural-historical activity theory and dialectic learning approaches for conceptualizing and implementing contextually relevant learning and teaching practices within (and beyond) the academic context of initial teacher education (ITE). The paradigm of human activity acts as unit of analysis in order to understand the multiple ways in which teaching and learning practices shape, and are shaped by social and cultural mediators, motives, roles, and interactions across institutional contexts. The paper aims to provide pedagogically meaningful descriptions of the context-sensitive and innovative "learning-for-teaching" and "teaching-for-learning" approach (Max 2010) within this novel ITE program.

This socially and culturally sensitive approach to human development resonates thoroughly with research on (professional) competence development (Max 1999), especially as regards the sound dialectical relationship between competence growth and human acting. Research on competence stresses a triple meditational impact of actions on the development of competence as they are means i) to demonstrate 'competence in context', ii) to acknowledge situated interventions as competent, and iii) to take responsibility and authority for own professional or personal development. Furthermore, an activity-theoretical framework allows for conceiving and achieving the dynamic co-evolution between individual and collective development within the academic context, a core facet of any competence development (Max 1999). Although most of the learning issues of the present paper address initial teacher education in the primary domain, they are relevant to other training areas, so that benefits might also be of use for conceiving teacher-training programs in other domains such as foreign language education or disciplinary trainings in either mono- or multilingual contexts.

At first, the paper briefly delineates three major pedagogical challenges related to the issues of societal, curricular and professional change in the Luxembourg context.

Learning and teaching in culturally diverse and changing contexts.

On account of its prospering economy, expanding labour market and attractive life standards, the demographic situation of the country is in constant growth. Today, about 45% of half a million residents are of foreign origin of which a large part comes from Portugal (80 000). Of the 350 000 domestic workers, 150 000 persons commute every day from the grande région (greater region), i.e. from neighboring areas of Germany, France and Belgium (Statec 2010). These migration- and mobility-related fluctuations affect the country's complex language situation, which is governed by a national language, Luxembourgish, and two additional official languages, German and French.

In school, the changing demands of a prevalent multilingual and multicultural population intersect with the curriculum-related language use and generate complex challenges for the teaching staff. In preschool, all the children learn Luxembourgish as the shared language for everyday communication. In first grade, German is used for learning to write and read, whereas French is introduced as an additional language from second grade on.

Research focussing on children's multilingualism up to the age of nine, on language diversity, learning Luxembourgish and emergent literacies (Portante and & Max 2008) outlined the complex multilingual language uses that a large majority of children commonly perform within school activities. A lot of pupils draw from other native languages than the languages taught in school, i.e., Luxembourgish, German and French. The majority use lusophone vernaculars, mostly of Portuguese origin. Practices of 'intra-sentential' and 'inter-sentential' code-switching are recurrent within classroom talk. Furthermore, the research evidenced that children live in complex multilingual settings outside of school, which has recently been confirmed by additional research (Dickes and & Berzosa 2010). Most children use Luxembourgish as a kind of peer-to-peer language in out-of-family contexts. Many siblings of Portuguese origins interact in Luxembourgish or French in their home settings. French is also used in a minority of Luxembourg's families. Audio-visual and print media bring Luxembourgish children in contact with the German language from a very early age. Recent statistical data published by the Ministry of Education (MENFP 2010) reveal a considerable decrease, i.e., of about 10 %, of Luxembourgish as the main language spoken at home over the last five years. Today, only 43,4 % of the preschool children and 50,3% of the primary school pupils use Luxembourgish as the main language at home.

Moreover, the increasing heterogeneity of the population and the related cultural diversity raise educational challenges with regard to the co-construction of a multicultural, inclusive and tolerant society stressing equity issues in family, work and social life and encouraging the participation of all citizens.

Enacting the curriculum and managing diversity

The ongoing demographic growth and cultural diversification generate a range of tensions in teaching practices especially when the complex linguistic backgrounds of the children clash with a normative, curriculum-oriented and teacher-centred instruction relying on prescribed textbooks and rigid learning tasks.

However, research data (Max & Stammet 2005) evidence how teachers reconsider their classroom practices and thrive to create innovative learning spaces. Pedagogical practices are not limited to transmit predefined and objectified knowledge such as facts or rules, but draw upon the social, cultural and ethnic diversity of the school population at hand. Here, the children's diverse linguistic and cultural backgrounds or funds of knowledge (Gonzalez et al. 2005) work as resources for learning as they continuously expand the opportunities for participating in classroom activities and, hence, facilitate the learning of all children.

Moreover, the knowledge and learning society adds further challenges to a modern education curriculum spurred by large-scale initiatives such as the "e-inclusion initiative" of the European Commission (2006) or the PISA related 'learning and innovation' project by the OECD (2008). These approaches claim that classroom activities should allow children to develop skills of creativity and critical thinking, to collaborate and interact via digital tools, to learn with and from multimodal media, to solve context-sensitive problems through proper inquiry, and to auto-regulate their own learning and development.

The professional know-how to create classroom practices, which draw upon the children's resources and are intended to combine their specific demands with the current societal requirements, calls for extended expertise about learners' processes within culturally hybrid and technologically enriched contexts.

Acting as professionals and as 'experts on learning'

Numerous publications on teacher professionalism (e.g. Furlong et al. 2000; Gewirtz et al. 2009) emphasise that acting as professionals implies to operate in an investigative or problem-solving way and to found educational decisions on research-driven practice and evidence-based argumentations. These inquiry-related competences as regards processes of learning reach far beyond the range of instructional skills commonly advanced as the core expertise of the teaching profession.

In order to continuously improve professional competence across the life-span, teachers should be encouraged to assume greater responsibility for their own continuous professional development (European Commission 2005; Schratz 2005). Consequently, any ITE program has to stimulate an auto-reflective stance as a core element of a consistent professional practice. Moreover, it might also stimulate in-service teachers to continuously develop their professional expertise, e.g. by offering attractive opportunities to cooperate within ITE-related activities.

With regard to all these challenges and expectations, the planning of the BScE program (2004-2005) anticipated and practised the extension of teacher competencies in relation to upcoming changes in the national educational system. The new law for the fundamental school (Memorial 2009) compels teachers to implement competence-based learning curricula and set up interactive and formative evaluation practices. Furthermore, teachers have to cooperate in multi-professional teaching teams in order to i) facilitate inclusion and learning of all children within two-year learning cycles and ii) enhance the development of their school with the local partners.

These changes stress the teacher's role of being a social actor, who works within society and beyond the school boundaries. Any collaboration with the various partners and stakeholders at local, regional or (inter)national levels requests that teachers are aware of the specific circumstances contributing to societal cohesion and inclusion.

How to conceive teaching expertise and 'learning-to-teach'?

The nature and the genesis of teaching expertise are of central interest for re-configuring ITE practices within the university-based program. Most of the time, the training approach has been thought from an idealist epistemological perspective of knowledge construction splitting thought and material world, mind and body, individual and society. These dualistic frameworks, which Vygotsky had already criticised in his 'Historical Meaning of the Crisis in Psychology' (1926/1982), conceive of teacher training as an apolitical activity "directed at the acquisition and processing of information by the individual mind" (Kostogriz 2000: 9). This understanding of ITE is linked to a conception of learning that consists of accumulating knowledge elements, i.e. concepts, facts, models, rules, within a person's mind which is analogous to gaining possession of physical commodities. Once owned, they might "be applied, transferred (to a different context), and shared with others" (Sfard 1998: 6). The successful outcome of the dualistic acquisition-based training approach culminates in the evidence-based application of prior-defined skills and competencies by the teacher candidate in practice.

> Highly valued outputs can then become codified into competence statements or professional 'Standards' either imposed by the state or developed from inside the profession by researchers. 'Standards' can then be employed to measure both teachers' effectiveness and the quality of the teacher education programs they have followed (Ellis et al. 2010: 1f.).

This mastery of domain-specific knowledge, i.e. educational, pedagogical, didactical, organisational knowledge is validated as professional expertise and considered as a vertical shift from a low-skilled to a high-skilled member status.

With regard to the growing body of research on practice (Chaiklin & Lave 1993; Engeström et al. 2002; Engeström & Tuomi-Gröhn 2003; Hakkarainen et al. 2004) grounding on Vygotsky's materialist, social and dialectical approach, we champion a paradigmatic shift when conceptualizing learning and teaching practices within ITE.

Our argument is that a cultural historical framework (CHAT) offers a powerful theoretical and methodological lens that helps us "to understand today's deep social transformations" (Engeström 1999: 19). Among the various context-sensitive frameworks, CHAT in particular states that individuals and social collectives can only be understood dialectically, that is to say, *historically and in interaction with each other.*

From the beginning, this dialectical conception was working as a 'germ cell' for re-configuring the academic practice, i.e. the simplest and genetically primary unit of a functionally interconnected system as a whole (see e.g. Bakhurst 1991). It mediated the process of re-configuring ITE practices along Davydov's dialectical method of "ascending from the abstract to the concrete" (1990).

As regards ITE, the two inseparably intertwined processes of social acting and cultural appropriation develop as follows. On the one hand, the entire program is to be understood as an activity that comes into existence as it is "done" within interaction between subjects and cultural artefacts. On the other hand, all the actors of the program are embedded in this activity system that works as a kind of social matrix. Their thinking and goal-directed acting cannot be understood separately from the system(s) in which they are engaged. With reference to this interdependence, the co-configuration of learning and teaching practices within academic programs deals with "creating new systems of human social-practical activities" (Yamazumi 2005: 14).

A brief journey through three generations of CHAT

Cultural-historical activity theory is marked by three generations of development. The commonly called *first generation* originates in the work of Vygotsky (1978), who understands human actions as being mediated by cultural means, i.e., tools and signs. Vygotsky's focus is on the individual subject and is closely tied to object-oriented mediation. Within his 'subject-mediation-object' triad, the social and cultural world enters and shapes the human thinking and reasoning process.

The *second generation* is associated with Leont'ev's (1978) distinction between an overall activity at societal level that is driven by an object-related motive and individual actions, which are subordinated to conscious goals. This distinction allows for exploring how individual actions are part of a larger community and how large-scale activities are generating collective aspects of our lives. Engeström (1987) combines the notions of mediation (Vygotsky 1978) and division of labor (Leont'ev 1978) into a multi-mediational model that visualizes the structural dynamics within a collective activity system.

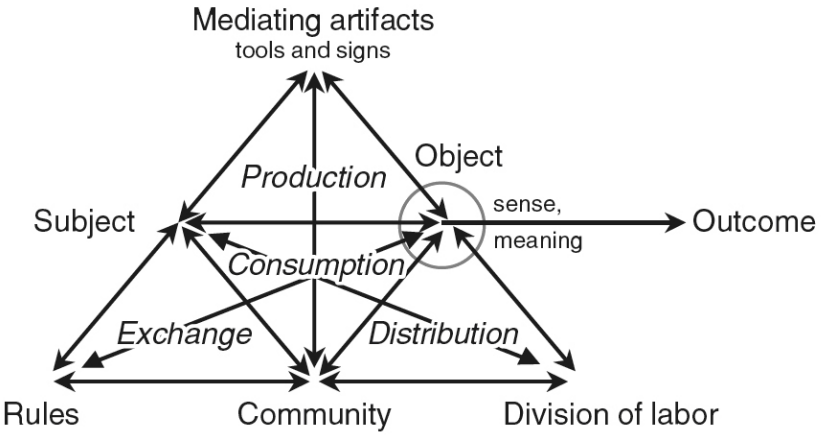

Figure 1: Activity as a meditational system (Engeström 1987: 178)

Whereas second generation relies still on the individual actor or on a single activity system in its analysis, *third generation* Activity Theory investigates processes at the level of networks, i.e. workplaces, institutions, agencies, health or educational systems,

where different activity systems interact and where social and cultural diversity grows into a core research issue.

Third generation models seem suitable for our research about co-configuring ITE. They expand the 'unit of analysis' to a network of interacting activity systems, which all advocate a specific object on their own. Figure 1 displays the principal stakeholders in this field, i.e.

- the university as the training institution,
- the local schools (preschools, primary schools, secondary schools or schools for children with special needs) as the related workplaces and actual partners for the semester internships,
- the political authorities (Ministry of Education, Ministry of Culture, Higher Education and Research) in charge of the national school system,
- associations and leagues acting in favour of specific purposes linked to children's interests (migrants, disabled, gifted…) or educational domains (health & sports, music & art…).

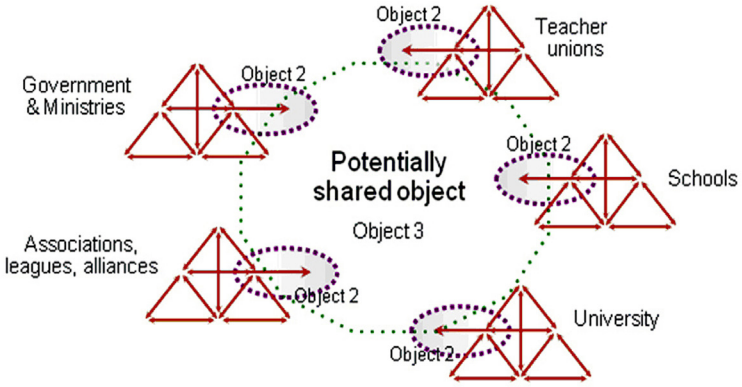

Figure 2: The main interacting activity systems in ITE as model for the third generation of Activity Theory

Through means of dialogue or explicit developmental work the different activity systems expand their initial object 1 into a broader object 2.

> This expansion approaches both objects and outcomes in a partial overlap. In this cross boundary object 'exchange' a new object 3 appears. This 'third object' gives rise to a 'seed of transformation'. In other words, the newly-appeared 'third object' gives rise to a driving force for the transformation of the original activity system by means of feedback to the respective activity systems (Yamazumi 2005: 78).

Upcoming tensions and contradictions within the network are conceptualised as potential driving forces of innovation, change and development within and across the systems' boundaries.

In the meantime, this broader scope for analysing activity (Matusov 2007) has generated considerable amount of scientific work grounding on new analytic concepts, which create and analyse exchange, dialogue and collaboration across boundaries (e.g.Tuomi-Gröhn 2005; Engeström & Tuomi-Gröhn 2003).

Learning as individual and collective endeavour

Sociocultural and context-sensitive approaches relate learning mostly to concepts such as participation (Sfard 1998), peripheral legitimated participation (Lave & Wenger 1991), communities of practice (Wenger 1998), or acting with physical and semiotic tools (Säljö 1998; Kozulin 2003).

Activity theory itself does not include a theory of learning, but CHAT-related pedagogical concepts are to be found in Engeström's (1987) theory of expansive learning that seems to be appropriate to study learning processes at a system level with regards

to the dialectical approach we sustain. Expansive learning is qualitatively different from acquisition-based and participation-based approaches as "learners learn something that is not yet there. In other words, the learners construct a new object and concept for their collective activity, and implement this new object and concept in practice" (Engeström & Sannino 2010: 2). In this line of thinking, Paavola et al. speak about "knowledge creation" (2004) as a further learning metaphor.

Expansive learning fits our purpose as it is focussing primarily attention on communities as learners. The approach goes beyond learning as a unidirectional achievement from an incompetent to a competent user status. It lays stress on the transformation and creation of culture itself, a dimension that acquisition and participation metaphors of learning do not take into account. Mwanza and Engeström (2005) specify the particular pedagogical stance of expansive learning as follows:

- Contents and outcomes of learning emerge as new forms of practical activity and artefacts constructed by both students and teachers in the process of tackling real life projects and during problem solving.
- Learning is driven by genuine developmental needs in human practices and institutions, manifested by means of disturbances, breakdowns, problems, and episodes of questioning the existing practice.
- Learning proceeds through complex cycles of learning actions in which new objects and motives are created and implemented, opening up wider possibilities for participants involved in that activity. (2005: 458)

Within the ITE program, this dialectical pedagogical stance is enacted as a core objective. Study practices aim to jointly create a culture of learning at the university level, whereas the enculturation within this participative culture should stimulate student-teachers to launch similar learning contexts in the local schools.

Within systems, networks or communities, learning arises as both an individual and a collective endeavour. This is the definite challenge for doing research about learning within activity systems. At the individual level, learning takes place through active involvement of a subject (or a group of subjects) in the particular activity, but more precisely, through the dynamic interplay of internalization and externalization processes as regards culturally-relevant knowledge and situated acting. However, expertise is also to be understood as a communal knowhow of teams and networks (Hakkarainen et al, 2004) or communities of practice (Wenger 1998). At the systemic level, learning arises through critically questioning the object of the activity system in which the subjects are engaged. It cannot be reduced to a pure aggregate of the system's components or a mere sum of the single subjects' knowing. "Expansive learning activity produces culturally new patterns of activity" (Engeström 2001: 139).

Moving within zones of proximal development

Vygotsky's concept of the "zone of proximal development" (1978: 86) was acknowledged from the planning phase on as a shared tool for conceiving and facilitating processes of learning and development within the program. Vygotsky defined the zone as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (ibid.).

Engeström adapted the individually oriented concept for analysing processes at the level of collective activities. He speaks about "the distance between the present everyday actions of the individuals and the historically new form of the societal activity that can be collectively generated as a solution to the double bind potentially embedded in the everyday actions." (1987: 174). Furthermore, he emphasises the need to go beyond the vertical dimension of development commonly expressed in terms of competence levels to attain (Engeström 1996) and to integrate the horizontal dimension as well. Horizontal expertise describes the moves of actors across boundaries in order to seek

promising information and tools from other sources, wherever these may happen to be available. This expertise is broader, multi-dimensional, poly-contextual, networked and is built up in many kinds of encounters and collaboration. It is a response to quick paced changes in work areas, where appropriate solutions cannot be codified as procedures to be repeated. People commonly speak of required flexibility (Tuomi-Gröhn et al. 2003). Recent concepts such as polycontextuality (Engeström et al. 1995), boundary-crossing, boundary objects, horizontal transfer (Engeström & Tuomi-Gröhn 2003), or boundary zones (Tuomi-Gröhn 2005) tackle opportunities for improving dialogue and interaction between communities or institutions, which share a certain object of activity, here, educating upcoming teachers.

The zone is a convincing metaphor to reflect on processes of learning and development both on the individual and collective level. The zone designates much more a space to be explored by the actor than a stage to be attained. Furthermore, explorations can be realised by a myriad of movements, in any direction and even beyond the given borders. The actor is free to create new pathways and intersections, alone or with appropriate support, which reshape the familiar ground. Moreover, these achievements do also pay attention to the struggle it takes to step out of dominant tracks and leave common areas, i.e. critical moments, power relations, and so on.

Creating innovative spaces for learning and development

With specific reference to the aforementioned challenges and interactive learning issues, the programme strives to encourage innovative trails, new crossroads and pioneering conceptualizations for all participants. More particularly, it creates innovative spaces for learning and development across conventional boundaries, i.e. a) studying in transdisciplinary modules across academic disciplines, b) interacting through multimodal media across semiotic domains and various languages and c) "learning-for-teaching" across different educational contexts (university-school).

These spaces are governed by an overall 'learning how to learn' study approach, that is deployed to educate upcoming teachers as 'experts on learning'. This paradigmatic principle underpins the pedagogical practices of the program and encourages learning at all program levels and among all actors involved. Research-based study tasks about children's and students' own learning processes create meaningful interactions between teaching practice and academic work and allow for the enactment of theory and vice versa. The construction of theoretical, pedagogical and didactical concepts is strongly emphasized and recurrently used for understanding not only the children's learning but also one's own processes.

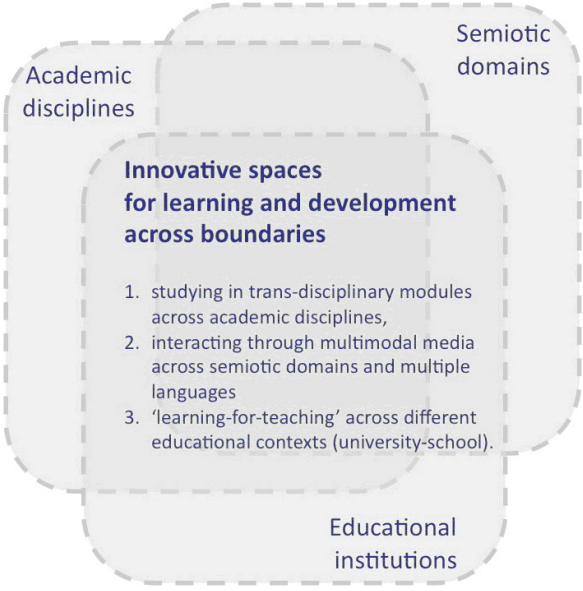

Figure 3: Innovative spaces for learning and development in ITE

Advocating a strong transdisciplinary approach, the Bachelor of Educational Sciences challenges taken-for-granted boundaries such as theory-practice, research-training, teaching-learning, academic disciplines-school contents, university-school context or expert-novice. Study modules within the program are organized along and within eight transdisciplinary curriculum lines (TCL) such as 'Learning as practice', 'Schooling in a multicultural society', 'Researching learning in context', or 'Signs and signifying practices'. TCLs are focusing on a broad topic from the educational field, which is studied across disciplinary perspectives.

The TCL 'Signs and signifying practices' merges academic topics such as languages, ICT, graphical arts, motion and music that traditionally are being taught on their own. This combination within a shared educational space allows the opportunity to propose integrative courses that combine different modalities in a pioneering way. Examples of innovative courses are 'Multilingual visual communication', which blends graphic design and multilingual issues, or 'VJ-ing the multilingual educational space', which combines multilingual issues, video art, music into a public live performance. Moreover, all these modules are realised with (inter)national partners, i.e. teachers and students, strengthening academic ties across disciplines and institutions.

The University of Luxembourg promotes multilingualism through all its programs. German, French, and English are used as scientific languages and Luxembourgish as the national language for internal communication. The BScE program specifies the various languages used within a course in the official semester syllabus, which draws a distinction between four areas: class talk, written assessment, mandatory readings and further resources (see Figure 4). According to the teacher's language proficiency, a course is taught in either a mono-, bi- or, as most of the courses, in a multi-lingual mode.

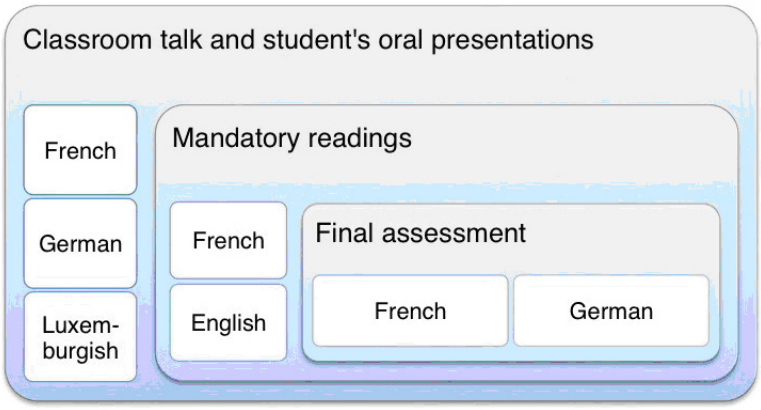

Figure 4: Language use in a course (excerpt of the semester syllabus)

The "learning-for-teaching" approach innovates in striving to interconnect research-driven field activities with academic concerns of knowledge building across institutional boundaries. Participative internships and practitioner-related research in different educational contexts and professional communities are at the very heart of the overall study approach. This concern governs how student teachers will understand their role as teachers and organize their 'teaching-for-learning' work. However, as the study activities of the ITE program are shared across university and school contexts, the teacher-students are facing major inconsistencies when making their way through bounded activity systems such as campus and school(s) with competing discourses and practices.

The research-based study tasks about children's and students' own learning processes are not only sustaining the academic character of the study approach, but also initiating a two-directional interchange between teaching practice and academic understanding.

Multiple support for learning and development across boundaries

As regards the development of teaching expertise and specific competencies, the program is highly concerned with empowering its members to move effectively and independently across these innovative spaces. According to the dialectical framework, the students are seen as responsible authors of their personal and ongoing professional development. Their "voices" are encouraged in a broad variety of contexts and through authentic individual and collective productions.

Academic work takes place in a collaborative learning culture that values and supplies all kinds of available resources, i.e. of material, digital, social and conceptual kind. As the competent use of digital learning technologies is forwarded as a core learning outcome of the program, ICT enriched practices are underpinning all kinds of training settings. The ICT facilities support the constitution of a collaborative learning culture, a shared knowledge base and a social memory around students' individual and collective contributions. These artefacts are related to inquiries on children's learning processes and promote relevant study activities such as cooperating, negotiating, discussing, sharing, connecting, internalising and externalising.

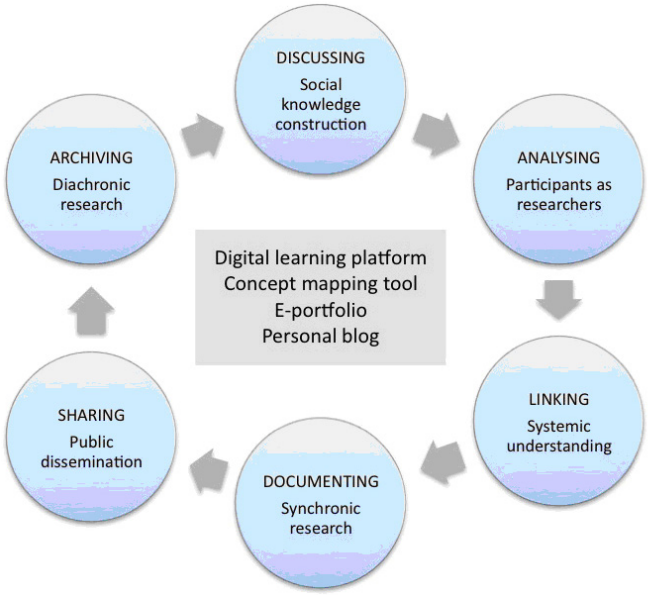

Figure 5: A multi-purpose learning environment mediated through ICT tools

Context-sensitive approaches stress learning as enculturation within communities, which implies active engagement in socially constructed practices with more experienced others. In this sense, the BScE program nurtures practices of apprenticeship, participatory and guided participation (Rogoff 1995) in diverse communities to put students in contact with a broad diversity of professionals. Scaffolding (Wood et al. 1976) through teacher-student tutorials and peer-tutoring initiatives facilitate the students' efforts to complete the study tasks successfully, e.g. to set up their personal study project and the different collaborative inquiry projects during the semester internship periods.

Furthermore, the program stimulates a close contact between teachers and students by offering only seminars and work sessions in small study groups (with about 35 students), which are designed as occasions to practise off-centring and perspective change. Teachers are continuously encouraging students to critically analyse, i.e. monitor, reflect and evaluate, their personal initiatives in order to promote the development of analytic competencies and critical thought. Moreover, the highly-promoted project work facilitates processes of creativity, inspiration and personal accomplishment.

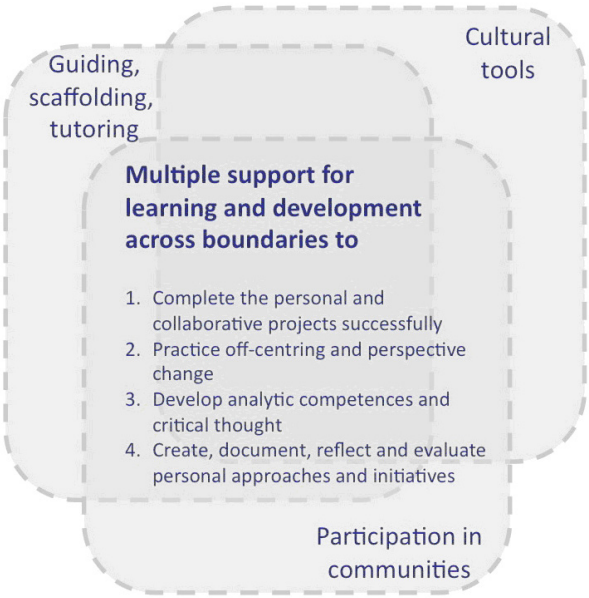

Figure 6: Multiple support for learning and development in ITE

With regard to the aforementioned specificities of the program's academic culture, the particular learning and developmental zone might be displayed by graphically crossing the axes of academic challenge and provided learner support (Mariani 1997). In the quadrant where the high-challenge study curriculum intersects with the highly-supportive approach, a zone of proximal development (ZPD) unfolds and encourages all the participants to enact their potential and to successfully engaging in new learning trails.

For the program management, a visual artefact such as Fig. 7 serves as a conceptual device and heuristic tool for improving the learning culture and managing its setup. However, we have to acknowledge that, although support and innovation are appropriately encouraged, the ZPD has always to be thought of "as a multi-dimensional and tension-laden space in which qualitatively different developmental directions and priorities struggle and choices are made by real actors between alternative futures" (Engeström and Sannino 2010: 4). As regards research, the graphical representation might be used as an analytic tool for interpreting data about the learning progress of members through whose eyes and interpretations the activity is constructed.

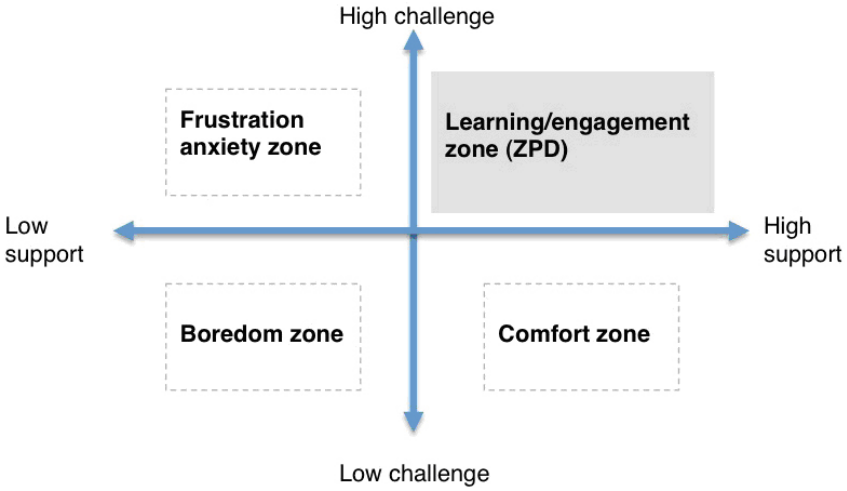

Figure 7: Locating a supportive and challenging ITE learning culture within four kinds of learning environments (following Gibbons 2009)

Multilingual – multimodal visual communication as boundary object

Referring to the aforementioned conceptual work on learning, development and activity, we now briefly elucidate horizontal forms of learning in a specific learning-for-teaching activity in the novel BA program. As an example of an innovative multimodal and multilingual learning context fostering dialogue, meaning making and contradictory struggle among different parties, we delineate processes in a course of the Transdisciplinary Curriculum Line 'Signs and signifying practices'. The innovative course "Multilingual visual communication - in education?" was driven by the issue, whether complex and dynamic concepts as well as content topics from the domain of multilingual education could be elaborated and materialized through visual-communicative processing.

The course brings together two groups of students with their teachers, which engage in dialogic problem-solving and joint productive activity as regards the course topic as a common concern. One group are Luxembourg students in their second and third year of studies in educational sciences, the other group are Italian BA students in their third study year of design from the Free University of Bolzano, Faculty of Art and Design.

According to the delineated CHAT framework, we direct our attention towards the shared zone of concern where elements from two activity systems, i.e. educational studies and design studies, enter into contact and create opportunities for mutual learning and development. These 'boundary zones', where exchange and negotiation among participants with different backgrounds and viewpoints take place, might be qualified "as being polycontextual, multi-voiced, multi-scripted and shaped by alternative and often oppositional discourses, positionings and practices" (Max 2010: 216). In the present case, the boundary zone was first initiated within a joint study week in Spring 2007 at the University of Luxembourg, it ran over the entire summer semester when collaboration was mediated by ICT tools and online tutorials, and was officially closed with a presentation of the concrete outcomes at the "Bi- and multilingual universities - BIMU" conference at the Free University of Bolzano in September 2007.

Interaction and collaboration within the 'in-between zone' is mediated by a "boundary object" (Engeström & Tuomi-Gröhn 2003). As the term is differently used in the research literature, we specify it here "as a negotiated and jointly developed object of an emerging (boundary zone) activity with a heterogeneous team of boundary crossers as its subject" (Max 2010: 217) in order to distinguish it from boundary-crossing tools. The latter are material or semiotic artefacts, which are moved from one context into another by boundary crossers or specific 'change agents'.

Partners from two educational settings may attribute different meanings to a 'boundary object', but it has dimensions in common that make sense across community boundaries. The co-developed 'boundary object' will give raise to a specific boundary zone activity that might also generate particular boundary practices mediated through new tools and jointly negotiated rules or roles. These innovations may induce systemic change within and across the bounded activity systems as well.

In the present case, the 'boundary object' was the challenge to explore the creation of multilingual and multimodal communication tools/practices in the field of education. This general object was narrowed down by the participants to the notion of 'multilingualism' after initial brainstorming activities and ample discussions. The students agreed to concentrate their joint efforts on enacting this concept into innovative communication tools for educational purposes.

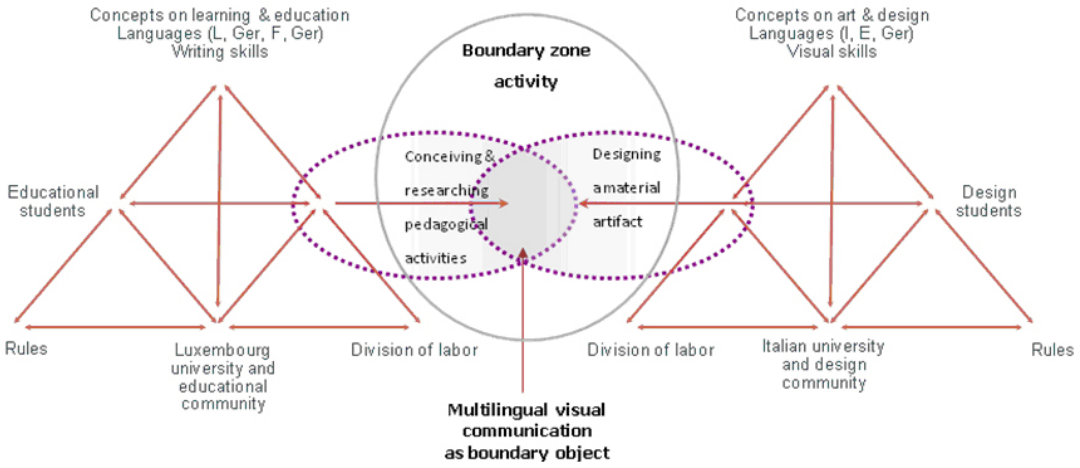

Figure 8: Systemic view of the boundary zone activity and the two interacting activity systems

The systemic view (see Figure 8) displays the joint course as boundary zone in between the activity systems of educational sciences and design studies with their related object and tools. Potential areas of contradictory struggle and negotiation about the shared concern are related to the differing objects of student teachers and design students as regards their main academic activity, i.e., developing expertise in learning and teaching vs. expertise in visual arts, communication and design crafts. In this sense, the boundary zone may be analysed as an 'in-between arena of polycontextual practices' (Edwards 2005: 4) where elements of both activity systems are woven together according to Cole's dynamic conception of context as 'that which weaves together' (Cole 1996: 135). The idea of weaving together can be traced in the various outcomes of the six 'boundary-crossing groups' (see Figure 9).

	Visual communication practice fostering multilingualism	Created artefact
1	Multilingual UNO game to improve language skills	Card game
2	Italia - Lëtzebuerg, visualization of multilingual and cultural exchange between and in the two states.	Multilingual map
3	Der Traum vom Fliegen - Wenn Sprachen aufeinandertreffen, überlappen sich Geschichten, Mentalitäten, Eigenarten und Neues entsteht. Dadurch wird das Denken und das Bewusstsein erweitert.	Multilingual visual storyboard
4	A simple and at the same time complex object made of a piece of paper suggests a whole lot of creative ways of playing with languages while socializing with other people	Language dice
5	A multilingual crossword using proverbs and phrases from five different countries	Multilingual crosswords
6	Learning new languages may appear difficult, but in the end it is worth it!	Multiplayer board game

Figure 9: Outcomes of the boundary zone activity

A closer look at the concrete outcomes reveals how the different groups bring together notions from the educational sciences such as learning, play, games, maps or storytelling in an innovative interplay with concepts from design emphasizing shape, support, color, function or creativity. The newly created artefacts such as dice, game cards or boards, express i) the student teachers' concerns for triggering processes of meaning making among interactants, which are mediated by narratives, play or gaming tasks, and ii) the designers' concerns about the ergonomic issues and the sense of touch when shaping haptic tools for manipulative interactive purposes. A further concern of the designers was to combine all the outcomes within one single design artefact, which was published in an innovative brochure format (Lensink et al. 2007) and introduced as a communica-

tion artefact at the international BIMU conference at the Free University of Bolzano in September 2007.

Figure 10: Tthe language dice as a newly created artefact (Lensink et al. 2007)

Multilingual language use is enacted at different levels within this boundary-crossing activity. First, it is defined as the object of the boundary activity and transformed into various outcomes underpinned by the very concept itself. Second, multilingual language use is mediating the oral and written interactions as a semiotic tool within the different project groups. Third, multilingual language use is acknowledged and enacted by people, i.e. the conference participants, who engage in playful interaction mediated by artefacts from the specific course.

Conclusions and implications

The cultural-historical theory of activity (CHAT) as one of several lines of thinking and research derived from the early 20th century cultural-historical school of Russian psychology, offers a promising lens to analyze theoretical and practical issues related to learning and development within the academic programs. Several remarks however have to be made.

First of all, we must remember that CHAT is less a theory or a methodology than an open research framework for studying different forms of 'praxis' as developmental process, both individual and social levels interlinked at the same time. Wardekker (2010) characterises CHAT more as a way of thinking than a well-defined and coherent set of statements, a "paradigm that invites us to think dialectically; that is, in terms of tensions that produce change and development" (2010: 241).

A CHAT–based analysis outlines also a number of frictions within the ITE system's components that are creating both productive and prohibitive tensions for further change and development. They have to be acknowledged as levers for improving the training system under study, not only as regards a smoother functioning, but as regards the dynamics of learning in play and, to a larger extent, the epistemological and methodological foundations underpinning the development of expertise.

A materialist perspective on these phenomena will depict the processes of dialogical interaction and meaning making among the interactants and the cultural tools-in-use as "multiple systematically interacting elements" (Engeström & Miettinen 1999: 9) and go beyond the physical sciences' linear causation models. The development of teaching expertise is conceived of as an ongoing process of tension and struggle between controversial positionings and alternative discourses in the area of practice. However, when the training approach is conceived as a "multivoiced and self-(re)organising system in which participants both reproduce and transform, internalize the culturally pregiven and create new hybrid practices, texts and identities" (Kostogriz 2000: 3), the predictability of expertise development decreases in comparison to nomothetic or idealist frameworks. Moreover, the related uncertainty bursts out as an ongoing cause of frictions and requests for an idealistically defined fund of knowledge and skills to draw upon.

However, uncertainty cannot simply be eradicated or avoided through non-critical approaches. We have to learn to deal with it in a positive and constructive way; in ITE and in general education. The BScE-related "learning-for-teaching" culture faces this challenge as shown in the present paper by encouraging the student-teacher to focus on his/her (inner, social and contextual) resources and to develop his/her inner strengths through critical reflections on "learning-for-teaching and teaching-for-learning" practices. Edwards speaks about "resourceful teaching for resourceful learning" (2010: 72), whereas Wardekker mentions that "progressive pedagogy, in most of its many forms, emphasizes the development of all faculties and possibilities that a given student potentially has, finding certainties in themselves" (2010: 244).

Hence, teaching expertise is not a product oriented thing in and of itself, but it is a process-object of human activity. As regards expansive learning and the dialectics of individual and collective development, i.e. when our acting shapes the context of development and is shaped by this context, research-driven teacher education and expertise must allow upcoming 'teachers-as-learners and learners-as-teachers' to improve their participation in complex educational and societal practices. This inquiry-based expertise goes beyond reflecting on one's own teaching practices according to methodological issues or "how to act" questions. ITE must develop social actors who critically "engage with the aims of their actions and those of the cultural practices within which they act" (Wardekker 2010: 244f.).

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Appendix:

Description of the course from the students' syllabus

Die Option (mit hohem Gruppen-Workshopanteil) hat zum Ziel, Studierende mit Methoden und Verfahren der visuell-kommunikativen Aufarbeitung und Darstellung komplexer, dynamischer Konzepte und Inhalte bekannt und vertraut zu machen.

Dabei folgt die gemäß Kriterien moderner, multimedialer Inhaltsvermittlung und Kommunkationspraxis konzipierte Lehr- bzw. Workshop-Veranstaltung drei grundlegenden Arbeitsfeldern:

a) Einführung in Praktiken und Verfahren der vertieften (visualisierenden) Aufarbeitung von komplexen, ggf. nur bedingt sprachlich zugänglichen Konzepten in allgemeinen, insbesondere jedoch in Bildungskontexten unter Berücksichtigung von gruppenspezifischen visuell-kommunikativen Habitus bzw. Rezeptionsverfahren;
b) Erschließung und Definition von komplexen Konzepten bzw. Begriffen im Rahmen der Ausbildung (z.B.: „Lernen", „Entwicklung", „mehrsprachige Kommunikation", „Kompetenz", „Leistung", „Evaluation", „Profil" ....) nach i) visuell-kommunkativen Kriterien und ii) gruppenspezifischen Rezeptions-/ Interpretations-Praktiken
c) Ausarbeitung von visuell-kommunkativen Objekten und Konzepten aus den unter b) erwähnten Bereichen