TRAINING NEEDS ASSESSMENT ON LEARNER-CENTRED PEDAGOGY IN TEACHER TRAINING COLLEGES IN RWANDA (SEPTEMBER 2014)

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Contents

Introduction

Promotion of Learner-centred Pedagogy in teacher education in Rwanda

This study takes place in the framework of the programme on Learning Outcomes in Primary Education (LOPE) between the University of Rwanda – College of Education (URCE) and the Flemish Association for Development Cooperation and Technical Assistance (VVOB). One aim of the programme is to promote learner-centred pedagogy (LCP) in teacher education in Rwanda for all future primary school teachers. While the project addresses leadership and management performance at both the systemic and institutional level of participating Teacher Training Colleges (TTC), the specific target is to improve the quality of teaching and learning in the TTCs. The programme seeks to achieve this through professional development of all tutors in the TTCs and integration of LCP in the initial teacher training curriculum.

The programme is carried out over a three-year period (2014-16) following a cascade model involving capacity building of around 54 tutors and college-based mentors, followed-up by training of all tutors in 13 TTCs nationwide.

This study provides an analysis of the current status of teaching and learning and the conditions for application of LCP in TTCs. The training and capacity development needs assessment study initiated the design of the professional development programme on LCP for the tutors.

After a desk review of studies and monitoring reports that were carried out by other partners in initial teacher training, a quantitative self-report questionnaire was developed to complement the findings of these studies. Data collected on access to resources, attitudes, knowledge, skills and practice at the level of the individual tutor, allowed for an exploration of the interrelations between these factors, leading to more insight in the conditions for LCP in teacher education.

In what follows we first provide background information on the promotion of LCP in Sub-Saharan Africa (SSA). Afterwards, we describe in more detail the methodology of the self-report questionnaire at the level of the individual tutor, we present the findings and we conclude and discuss the design of a professional development programme for the target group.

Learner-centred Pedagogy in Sub-Saharan Africa

Trends in pedagogy and teacher education

The history of formal education in sub-Saharan Africa shows that although there have been some innovations in formal sub-Saharan education system, the structure of the school system, assessment and in some cases the curriculum itself continue to resemble those developed during colonial period (Vavrus, Thomas, & Bartlett, 2011).

The colonial period was characterized by unequal education systems that restricted enrolment and limited the curriculum to content consistent with the needs of mission societies and the colonial administration. It is in view of this that much of the educational reforms in sub-Saharan Africa was based on the desire to break with this colonial past. However, there was a variation in the degree to which former colonies in sub-Saharan Africa modified the structure and content of the formal education systems in the first few decades after independence. Some countries reorganized TTCs and changed the language of instruction, methods of instruction, and content of school curricula but in other countries minimal modifications were made.

The gradual shift in policy (not necessarily in practice) from teacher-centred pedagogy toward learner-centred pedagogy in sub-Saharan Africa has been a result of economic, educational, and political factors. The use of LCP also emerged from the view shared by certain international organizations and national policymakers that this approach would contribute to the expansion of democracy. The adoption of Education for All as a global policy which included "active learning techniques" and "relevant curriculum" among the conditions for quality education also contributed to the emergence of LCP.

Based on the above factors, global educational trends toward the adoption of LCP have been noted and adopted by many African policymakers and planners. Unfortunately, it appears that the learner-centred pedagogy is actually not fully implemented.

Teacher education reform in several African countries, especially in Anglophone Africa, have been attempting to integrate LCP into the preparation of teachers. However, it appears that teacher preparation programs have generally not adequately integrated this approach into the curriculum. Therefore, policymakers and teacher educators should reasonably support teachers' acquisition of and familiarity with the LCP.

Reasons for promotion of learner-centred pedagogy

Three categories of benefits for the promotion of the LCP have been identified as follows (Vavrus et al., 2011):

Cognitive and psychological rationales: The term cognitive refers to mental processes, such as remembering or solving problems, while psychological encompasses cognition but also includes the study of emotions, motivation, and interpersonal relationships. Research shows that there is a cognitive and psychological benefit in using LCP.

Political rationales: The literature on learner-centered pedagogy draws on studies shows that the way teachers teach (not only the content of their classes) may contribute to students' political socialization and engagement in democratic processes. The relationship between students and teachers, especially opportunities for students to express their views in the classroom, is considered especially influential in developing students' views on democracy and their degree of civic engagement.

Economic rationales: As countries diversify their economies and seek to become more competitive in the global economy, they need to equip youth with new sets of skills. Students need to learn how to communicate effectively in decision-making teams and to solve problems that arise in these more flexible environments. Memorization of facts is no longer suitable for the competitive global market where the skills of inquiry and problem solving to address rapidly-changing environment are needed.

Based on the above mentioned rationales and the general agreement among scholars and policymakers that the quality of education needs to improve, there should be a focus on the use of LCP in Sub-Saharan African's education system for quality education to be achieved.

Challenges faced by teachers in using learner-centred pedagogy

The main challenges faced by teachers in using LCP are as follows:

Teachers' philosophical concerns about learner-centred pedagogy: The philosophical challenges about learner-centred pedagogy is based on the assumption that knowledge can be constructed by teachers and students. The assumption may engender cultural conflict because it challenges the authority vested in teachers as the person in the classroom who possesses knowledge.

Teacher's practical concerns about learner-centred pedagogy: There are a number of practical issues related to the learner-centred pedagogy to be taken into consideration—School-based professional support, conditions of teaching, medium of instruction, and examinations based on behaviourist assumptions about knowledge. For the case of Rwanda, Ntahobavukira (2014) identified challenges encountered by both teachers and students while attempting to apply learner-centered pedagogy. These challenges are overcrowded classrooms and curriculum, the issue of language, the lack of teaching materials, etc.

Teachers' educators' limited use of LCP: Research shows that with few exceptions, teacher education programs in sub-Saharan Africa utilize the technical rationality model based on a behaviourist view of teaching and learning rather than the reflective practitioner model even as they teach student teachers to use active learning strategies. The other problem is the lack of classroom experience among some tutors in colleges. In other cases some tutors at TTCS or

university teachers may have expertise in education (teaching methods) and lack expertise in academic subjects or vice-versa.

In the context of Rwanda, very little is known about the use of LCP in the schools. Recently, a study conducted by (Ntahobavukira, 2014) in Nyarugenge District shows that English teachers in secondary schools are equipped with theoretical knowledge and skills in learner-centered pedagogy but they do not apply it frequently.

If LCP is to move from paper to practice, policymakers should try to address the above challenges and focus on the following policy considerations:

1) Teacher preparation at TTCs and universities needs to be reorganized to integrate LCP in all subjects.
2) The content and length of study for initial teacher education and opportunities for continuing professional development through in-service programs should be taken into consideration
3) Although LCP is encouraged in policy reforms in many African countries, curricula and national examinations continue to be based on behaviourist objectives that largely test students' ability to recall factual information rather than think critically and analytically about it. Therefore, policy reform across the education system needs to show how LCP should be practically integrated in the curriculum and national examination.

Conceptual Framework

It is clear that there are a number of factors that can hinder or influence the uptake and application of LCP in education, also in teacher education. In the conceptual framework hereunder (figure 1) we conceptualize these factors and the interrelatedness of these factors at the level of the individual tutor. Apart from a set of non-manipulative factors, like teacher qualification, years of experience, age and gender, there are a series of external manipulative factors, or conditions such as access to ICT and availability of LCP resources and participation in professional development that can be addressed with external support. On the other hand, there are internal factors such as conceptions of student learning (attitudes) and pedagogical and technological-pedagogical knowledge that are less straightforward to address. As dependent variables, this model not only includes the application of LCP, but also the practice of cooperation and sharing amongst tutors and the use of ICT for teaching and support of student learning. These dependent variables are expected to influence each other as well.

Figure 1: Interplay between conditions for LCP, knowledge, attitudes and practice
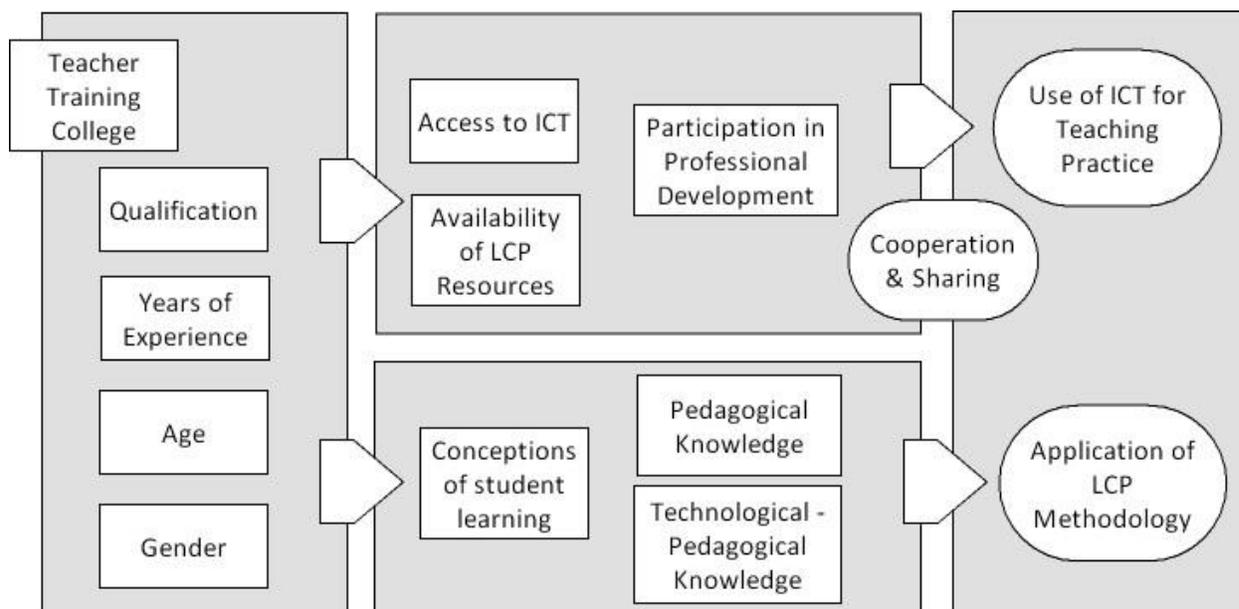
Research questions

There are two main research questions that we want to address with this baseline and training needs assessment study:

1. What is the current situation at the level of tutors on the 13 TTCs with regards to:
    - Access to ICT and availability of LCP resources
    - Conceptions of student learning
    - Pedagogical Knowledge and Technological-Pedagogical Knowledge
    - Participation in professional development
    - Cooperation and sharing
    - Use of ICT for teaching and support of student learning)
    - Application of LCP methodologies
2. What is the correlation between these different influencing and hindering factors at the level of the tutors in the 13 TTCs?

Based on the findings of this study, we want to draw conclusions and develop recommendations for professional development for tutors on the 13 TTCs.

Methodology

Data collection

All (13) TTCs in Rwanda participated in this study. Data collection took place from May to July 2014, using a self-report questionnaire presented to all teaching staff of the participating TTCs. In total 228 questionnaires were completed by the respondents, on a total of 296 tutors in the TTCs (response rate of 77 %), with 70.5 % male and 29.5 % female respondents. The mean age of the respondents is 34.35 years old and the average years of experience are 7.36 years. The majority (81.9 %) of the tutors has an A0 qualification, 14 % has A1 and the remaining 4.1 % has A2.

Questionnaire scales

The questionnaire scales in the self-report questionnaire were adopted from international research on LCP and adopted to the context of teacher education in Rwanda. Cultural and practical interpretations were discussed with Rwandan education experts that were engaged in the LCP project. The final questionnaire consists of 94 items. In annex 1 we describe in more detail the questionnaire scales that are depicted in the conceptual framework. Descriptive statistics and reliability coefficients can be found in table 1.

Table 1: Descriptive statistics, reliability coefficients (and example items) of measurement scales

	N	α	M	SD
Availability of ATL resources	5	.702	14.63	3.740
Conceptions of student learning – Intake of knowledge	9	.576	32.32	4.419
Conceptions of student learning – Construction of knowledge	8	.732	31.97	4.399
Pedagogical Knowledge	7	.895	29.51	3.795
Technological-Pedagogical Knowledge	5	.813	19.33	3.248
Cooperation and sharing	6	.843	17.07	3.816
Use of ICT for teaching practice	7	.869	13.63	5.046
Engagement of students with ICT	5	.858	10.20	3.984
Engagement of students in LCP	17	.907	52.91	8.683

Analysis

Descriptive analysis of the questionnaire data were applied to draw a picture of the situation of TTCs in Rwanda concerning tutors' use of ICT for teaching practice and application of LCP methods and techniques as well as their access to LCP resources, conceptions of student learning, pedagogical and technological-pedagogical knowledge and cooperation and sharing.

Exploratory multiple regression analysis was applied to analyse the influence and interrelatedness of the non-manipulative and manipulative factors at the level of the tutor on use of ICT in teaching practice and application of LCP.

Findings

Access to ICT and LCP resources

In this study, 40.5% of tutors surveyed have access and use computers at home. 88.6% of them use computers at work, when only 36.1 % have laptops (see table 2). Therefore, it can be said that the majority of tutors have access to and use computer tools, but not at home and not for individual use.

Table 2: Access to a computer at home

Access to ICT	N	No (%)	Yes, sharing with others (%)	Yes, only for myself (%)
A computer at home	227	59.5	18.5	22.0
A computer in the TTC	227	11.5	75.8	12.8
A laptop	227	63.9	12.3	23.8

The majority of tutors reported that they have access to the internet (see table 3): 8.4% use internet both at home and in the TTC; 4% use it only at home; 36.6% use the internet in the college; and 21.1% use it in other places like in a cyber café. Since most of these tutors use internet in the college, these results are in accordance with those of table 1 and show that colleges have, to some extent, access to the internet. Again it is clear that access at home is still very limited. Also 30.0 % of the respondents claim to have no access to the internet at all.

Table 3: Access to the internet

Access to the internet (Q4)	% (N = 227)
Yes, at home and in the college	8.4
Yes, at home	4.0
Yes, in the college	36.6
Yes, in other place	21.1
No	30.0

As it is shown in table 4, few (32.6%) tutors have access to a projector in the TTC while 67.4% do not have access to this device. If the majority of tutors do not have access to a projector in the college, it means that they cannot use this device in the teaching and learning process.

Table 4: Access to a projector in the TTC

Access to a projector in the TTC (Q5)	% (N = 227)
Yes	32.6
No	67.4

About half of the tutors agreed that they had access to sufficient relevant self-study materials (44.8 %), and 37.6 % agreed they had sufficient and relevant training materials on LCP. Also related to the sharing of good practices the respondents are nog in complete agreement. Quite some respondents are neutral or disagree that this is done in their TTC. More than half of the respondents agrees that there is a well-functioning and up to date library and the availability of self-study materials were reported to be more available in TTCs. LCP resources are, to some extent, available in TTCs but not that there is an online and searchable Open Resource Centre

Table 5: Availability of LCP resources

Availability of LCP resources in the TTC			Entirely disagree	Disagree	Neutral	Agree	Entirely agree
Q6: In my college …	M	SD	%	%	%	%	%
(1) Lecturers/tutors and students have sufficient relevant self-study materials on teaching methodologies available for their use, e.g. self-study packages, research papers, academic journals.	3.11	1.040	5.60	28.00	20.60	41.60	4.20
(2) Lecturers/tutors and students have sufficient relevant training materials on teaching methodologies available for their use, e.g. training modules, PPT (PowerPoint) slides, and course books.	2.86	1.066	6.80	40.70	14.90	34.40	3.20
(3) Good practices on teaching methodologies are shared, e.g. on an online community of practice/forum, during conferences in the TTC, …	2.98	1.150	10.70	29.00	17.30	37.40	5.60
(4) There is a well-functioning and up to date library/resource centre with access to self-study and training materials on teaching methodologies.	3.31	1.064	4.60	21.90	21.50	42.00	10.00
(5) There is an online and searchable Open Resource Centre (or Content Management System or e-library) in place with access to self-study and training materials on teaching methodologies.	2.42	1.207	23.30	40.60	13.70	15.10	7.30

Conceptions of student learning

Factor analysis on all items asking for conceptions of student learning (Extraction method: PCA, 2 factors retained) reveals two dimensions: student learning as intake of knowledge and student learning as construction of knowledge. Only the items for the subscale in learning as construction of knowledge load as theoretically expected. Only this subscale is reliable (see table 1).

The respondents in this study strongly find themselves in the conception of learning as construction of knowledge (M =3.99, max. = 5). To a large extent, surveyed respondents agree or entirely agree with the conception of learning as construction of knowledge (see table 6). For instance, 89.3% affirm that they verify whether students master the subject matter by inviting them to rephrase the main ideas in their own words. Nonetheless, some respondents are neutral towards the conception of learning as construction of knowledge. This is the case of 13.9% who are neutral to the statement that students should take the initiative themselves to look for connections in the subject matter. Similarly, 12.60% of disagreement to the same statement illustrate that a number of respondents reject the conception of learning as construction of knowledge.

Table 6: Conceptions of student learning – Construction of Knowledge

Conceptions of student learning (Construction of Knowledge)			Entirely disagree	Disagree	Neutral	Agree	Entirely agree
Q7: To what extent do you agree …	**M**	**SD**	**%**	**%**	**%**	**%**	**%**
(2) Students themselves should take initiative to consult alternative sources in case they don't understand a part of the subject matter.	3.97	0.949	1.80	9.40	7.60	52.70	28.60
(6) Students should summarize in their own words what is being meant in the subject matter in order to learn.	4.04	0.923	0.90	8.60	9.10	48.20	33.20
(8) To verify whether they master the subject matter, students should try to rephrase the main ideas in their own words	4.20	0.824	0.90	5.40	4.50	51.80	37.50
(11) Students should take the initiative themselves to look for connections in the subject matter.	3.70	1.037	3.60	12.60	13.90	50.20	19.70
(13) Good education is education that leaves part of the preparations to the students (e.g. collection of background readings, preparation of presentations, …).	3.81	1.069	3.20	11.90	13.20	43.80	27.90
(14) To check their learning progress, students should themselves try to formulate and answer questions on the subject matter.	3.92	0.949	2.70	8.40	8.00	56.20	24.80
(15) In my opinion, students should, next to the books they are supposed to study, also conduct their personal research to find out what has been written on a particular topic.	4.17	0.858	0.90	5.80	7.10	48.20	38.10
(17) Students themselves should try finding examples of the subject matter.	4.05	0.845	0.90	5.70	10.60	52.90	30.00

Table 7 indicates that a major proportion of surveyed respondents agrees or entirely agrees with the conception of learning as intake knowledge. This is revealed by the large percentage (90.8%) of agreement or entirely agreement with respect to item "lectures/tutors have to tell students exactly what to do when asking question and giving assignments". Some respondents refuse to pronounce themselves vis-à-vis the conception of learning as intake knowledge. 19.60% kept silent on whether students have to know definitions and other facts by heart. However, also a big number of respondents (48.60 %) disagree with the suggestion that lecturers/tutors should teach the subject matter exactly as it is presented in the book.

Table 7: Conceptions of student learning – Intake of knowledge

Conceptions of student learning (Construction of Knowledge)			Entirely disagree	Disagree	Neutral	Agree	Entirely agree
Q7: To what extent do you agree …	**M**	**SD**	**%**	**%**	**%**	**%**	**%**
(1) It is better to only start a new topic after students master the details of the previous one.	4.06	0.913	0.90	8.50	7.60	49.30	33.60
(3) In good education, a lot of questions and assignments are given to verify whether students master the subject matter.	4.21	0.850	1.30	4.90	4.90	48.90	40.00
(4) Lecturers/tutors should teach the subject matter exactly as it is presented in the book.	2.59	1.011	9.50	48.60	18.90	19.80	3.20
(5) Lecturers/tutors should point out clearly what is important and what is less important to know.	3.56	1.059	3.60	17.20	14.50	49.30	15.40
(7) Students have to know definitions and other facts by heart.	2.95	1.141	8.00	34.80	19.60	29.00	8.50
(9) Lecturers/tutors have to tell students exactly what to do when asking	3.80	1.115	3.60	14.30	9.40	43.80	29.00

questions and giving assignments.						
(10) The lecturer should tell the students exactly what they need to know for a test/examination.	3.00	1.286	13.60	27.60	18.20	26.60	14.00
(12) Students should be capable of reproducing the facts presented.	3.81	1.035	3.10	11.10	12.40	48.00	25.30
(16) Lecturers/tutors should organize trial-tests or trial examinations to allow students to verify whether they master the subject matter.	4.29	0.778	0.90	3.10	5.30	47.60	43.20

Participation in professional development

Table 8 shows that a majority of tutors participated in professional development on LCP. Whilst 68.7% attended trainings, workshops and/or conferences, and 65.6% to the reading and learning about the LCP only 44.7% participated in community of practice. So, there is a need to put effort on sharing experiences on tutors' daily practices for their professional development on LCP through community practice. It must also be highlighted that still about one third of the tutors in the TTCs claimed they did not attend input trainings/workshop and/or conferences nor did any reading on the topic of LCP.

Table 8: Participation in professional development

Professional development on LCP	N	Yes (%)	No (%)
Attendance to input training(s), workshop(s) and/or conference(s)	227	68.7	31.3
Reading and learning about the topic	224	65.6	34.4
Participation in Community of Practice	228	44.7	55.3

Table 9 shows that respondents sometimes or regularly cooperate and share knowledge skills and experience with other colleagues. This occurs through trainings, workshops, group discussions and meetings. Lesson observations and feedback constitute also a channel for cooperating and sharing knowledge. Between 18 and 50 % of respondents never or rarely cooperate and share knowledge with their colleagues.

Table 9: Cooperation and sharing

Cooperation and sharing			Never	Rarely	Sometimes	Regularly
Q15: To what extent do you cooperate and share knowledge, skills and experience with other colleagues in your college?	M	SD	%	%	%	%
(1) Lesson observations and feedback	3.02	0.863	7.60	13.30	48.40	30.70
(2) Research/studies	3.08	0.809	5.00	13.70	49.30	32.00
(3) Study visits	2.62	0.888	14.00	23.90	48.60	13.50
(4) Works discussions and meetings	3.06	0.793	5.00	13.60	52.00	29.40
(5) Trainings and workshops	2.83	0.756	5.80	20.60	57.80	15.70
(6) Shared projects (for example Project or Problem-Based Learning)	2.41	0.966	21.40	29.00	36.60	12.90

Knowledge and skills

The means on the scales of pedagogical and technological-pedagogical knowledge indicate that teacher educators on average perceive to have good pedagogical knowledge (M = 4.22, max. = 5) and reasonable technological-pedagogical skills (M = 3.87, max. = 5).   There is a strong positive and significant correlation of 0.420 between these types of

knowledge (with p <.001), indicating that good technological-pedagogical skills go together with good pedagogical skills.

Table 10 shows that the surveyed respondents agree or entirely agree that they have pedagogical skills that are required for a teacher to efficiently plan and manage the classroom, adapt teaching to learners' characteristics and assess their performance. This is exemplified by the percentage of 94.2% of tutors who affirm to know how to organize and maintain classroom management. Some respondents choose to keep quiet vis-à-vis their capabilities to competently use a variety of teaching approaches and identify students' misconceptions. For example, 11.2% of tutors are not able to state whether or not they can use a wide range of teaching approaches in a classroom setting.

Table 10: Pedagogical Knowledge

Pedagogical Knowledge			Entirely disagree	Disagree	Neutral	Agree	Entirely agree
Q11: To what extent do you agree …	M	SD	%	%	%	%	%
(1) I know how to assess student performance in a classroom	4.23	0.707	0.90	1.80	5.40	57.60	34.40
(2) I can adapt my teaching based on what students currently understand and do not understand	4.23	0.722	0.90	2.30	5.00	57.00	34.80
(3) I can adapt my teaching style to different learners	4.19	0.714	0.90	1.40	8.10	56.80	32.90
(4) I can assess student learning in multiple ways	4.28	0.681	0.50	0.90	7.40	52.60	38.60
(5) I can use a wide range of teaching approaches in a classroom setting	4.19	0.719	0.00	2.20	11.20	51.60	35.00
(6) I am familiar with common student understandings and misconceptions	3.94	0.751	0.50	4.10	16.30	59.30	19.90
(7) I know how to organize and maintain classroom management	4.37	0.650	0.00	1.80	4.00	49.60	44.60

Table 11 shows that the surveyed respondents agree or entirely agree that they have technological-pedagogical knowledge that enables them to choose and utilize technologies to enhance students' learning. This is illustrated by 74.9% of tutors who affirm that they can choose technologies that enhance students' learning for a lesson. Concerning this same statement, 17.50% of tutors are neutral. There is a substantial number of tutors who stay neutral or disagree with respect to having technological-pedagogical knowledge.

Table 11: Technological-Pedagogical Knowledge

Technological-Pedagogical Knowledge			Entirely disagree	Disagree	Neutral	Agree	Entirely agree
Q12: To what extent do you agree …	M	SD	%	%	%	%	%
(1) I can choose technologies that enhance the teaching approaches for a lesson.	3.81	0.889	2.30	6.80	17.10	55.90	18.00
(2) I can choose technologies that enhance students' learning for a lesson.	3.86	0.868	1.80	5.80	17.50	54.70	20.20
(3) My teacher education program has caused me to think more deeply about how technology could influence the teaching approaches I use in my classroom.	3.92	0.907	2.20	4.90	17.40	50.00	25.40
(4) I am thinking critically about how to use technology in my classroom.	3.94	0.789	1.80	3.10	13.90	61.40	19.70
(5) I can adapt the use of technologies that I am learning about to different teaching activities.	3.83	0.833	1.30	5.80	19.30	56.10	17.50

Practice

Table 12 reveals that respondents never or rarely exploit ICT tools for teaching their subjects or for support of student learning. More specifically, 58.50% of tutors never integrate subject specific software into lectures whereas 50.70% never access information through CD-ROM/DVD as resource materials during lecturing. Likewise the majority of tutors never communicate electronically with their students. Tutors sometimes use these tools for producing electronic documents and accessing information. Concerning with students' accessibility to ICT resources, majority of tutors declare never or rarely engage their students to work with computers for their self-learning.

Table 12: Use of ICT for teaching and support of student learning

Use of teaching and learning resources for teaching and support of student learning (incl. ICT)			Never	Rarely	Sometimes	Regularly
Q14: To what extent you use ICT for …	M	SD	%	%	%	%
(1) Word processing for production of documents	2.50	1.036	23.10	21.80	37.30	17.80
(2) Communication and presentation software for lecturing	1.84	0.926	47.10	26.90	21.10	4.90
(3) Subject specific software for integration into lectures	1.61	0.829	58.50	24.60	14.30	2.70
(4) Information accessed through CD-ROM/DVD as resource materials during lecturing	1.78	0.915	50.70	25.30	19.50	4.50
(5) Electronic communication with students	1.72	0.940	56.30	20.50	17.90	5.40
(6) Internet/WWW as a source of information during lecturing	2.22	1.059	35.00	20.50	32.30	12.30
(7) Social media to interact and share with learners beyond the classroom	1.95	1.025	46.00	21.90	23.20	8.90
Q13: To what extent you let your students …	M	SD	%	%	%	%
(18) Work with the computer to orientate themselves to a new subject.	2.11	1.027	37.50	24.60	27.70	10.30
(19) Gather information from electronic databases.	1.98	0.958	40.20	27.90	25.60	6.40
(20) Use the computer to process collected data.	1.99	0.948	40.00	26.80	27.70	5.50
(21) Use different media to create appropriate products.	2.06	1.003	37.20	29.10	23.80	9.90
(22) Use the computer to communicate with others (locally and/or globally).	2.01	1.013	42.40	21.90	27.70	8.00

Most of respondent tutors agree or entirely agree that they engage their students in active teaching and learning (ATL). For example, 94.6% of tutors affirm to let students collaborate on certain tasks. Nevertheless, a substantial portion of tutors never or rarely engage their students in ATL especially in terms of outdoor activities using a project-based learning approach (43.4%) and working on independent learning projects (35.5%).

Table 13: Engagement of students in LCP

Engagement of students in ATL			Never	Rarely	Sometimes	Regularly
Q13: To what extent you let your students …	M	SD	%	%	%	%
(1) Define their own learning goals	3.14	0.794	5.40	9.40	51.30	33.90
(2) Identify strategies for achieving their goals	3.23	0.755	2.70	11.30	45.90	40.10
(3) Document their learning projects when working on tasks	3.10	0.818	5.40	12.60	48.60	33.30

(4) Learn in their own learning style and pace	3.03	0.807	5.50	14.60	51.60	28.30
(5) Collaborate on certain tasks	3.52	0.600	0.00	5.40	37.10	57.50
(6) Reflect on their process of achieving their goals	3.20	0.698	1.80	10.90	52.90	34.40
(7) Work in corners	2.82	0.853	10.10	16.10	54.80	18.90
(8) Do outdoor activities using a *Project-Based* Learning approach	2.52	0.967	19.40	24.00	41.90	14.70
(9) Do classroom activities using a *Problem-Based* Learning approach (starting from a defined problem)	2.97	0.860	7.60	15.60	49.10	27.70
(10) Work on independent learning projects	2.74	0.907	10.80	24.70	43.90	20.60
(11) Work on group learning projects	3.17	0.828	6.30	8.10	47.70	37.80
(12) Sharing and comparing their solutions	3.30	0.800	4.50	7.70	40.70	47.10
(13) Summarize their learning	3.40	0.684	1.40	7.30	41.80	49.50
(14) Apply learnt knowledge	3.32	0.746	3.20	7.30	44.10	45.50
(15) Do self-study individually	3.18	0.781	4.10	10.90	48.40	36.70
(16) Do self-assessment (self-correction exercises)	3.02	0.862	8.20	11.40	50.50	30.00
(17) Do peer- and group assessment	3.18	0.867	6.80	9.50	42.30	41.40

Factors influencing or constraining LCP

A hierarchy of sets of independent variables was formed and tests were carried out on the significance of increments to R^2 by means of the F ratio. The hierarchy of sets is an important part of the investigator's hypothesis statement (Cohen, 1968). In our research we started with non-manipulative variables at the level of the tutor (set 1).These variables were expected to be relevant to the dependent variable (application of LCP), but had to be controlled when measuring the contribution of manipulative teacher-level factors. In the first place we wanted to assess the importance of access to resources (both ICT and other resources for promotion of LCP) and professional development opportunities (set 2) after which we wanted to assess the net influence of pedagogical and technological-pedagogical knowledge (set 3) and conceptions of student learning (set 4). We finally wanted to reflect on the importance of the tutors' practice of cooperation and sharing and the use of ICT for teaching and support of student learning (set 5).

Hierarchical multiple regression analysis resulted in five models. Four of these models significantly explain a proportion of variance in the application of LCP (see table 14). Non-manipulative factors at the teacher level alone do not significantly explain any variance in the application of LCP. Nevertheless, women tend to display a more limited application of LCP than men, while age has a small negative influence on intensity and diversity of application of LCP. The influence of gender and age loses significance however, after entering factors such as access to ICT, and availability of LCP resources in the TTCs. Even though access to ICT does not significantly influence the uptake of LCP, the perceived availability of LCP resources in the TTCs has a positive influence on the application of LCP, also after adding other factors to the model (β of .252 to .113). Participation in professional development, own initiatives to deepen knowledge on integration of ICT or LCP or participation in communities of practice as such does not influence the uptake of LCP. However, pedagogical knowledge of the tutors does have a significant and positive effect, which is not the case for technological-pedagogical knowledge. Finally, even though tutors' attitudes and conceptions on student learning as construction of knowledge do not influence the application of LCP, those that actively cooperate and share knowledge and skills with peers and colleagues in their TTCs will also apply more regularly and more diverse LCP approaches (β = .315). Also those that let their students engage more often with ICT let them engage also more regularly with LCP (β = .119).

Table 14: Multiple regression analysis

Factors		Model 1	Model 2	Model 3	Model 4	Model 5
Non-man. factors	Gender (male)	.262[*]	n.s.	n.s.	n.s.	n.s.
	Age	-.022[*]	n.s.	n.s.	n.s.	n.s.
	Years of experience	n.s.	n.s.	n.s.	n.s.	n.s.
	Qualification A1	n.s.	n.s.	n.s.	n.s.	n.s.
	Qualification A0	n.s.	n.s.	n.s.	n.s.	n.s.
Access and prof. dev.	Laptop – for self	-	n.s.	n.s.	n.s.	n.s.
	Laptop – sharing with others	-	n.s.	n.s.	n.s.	n.s.
	Projector	-	n.s	n.s	n.s	n.s
	Internet – Home and in TTC	-	n.s.	n.s.	n.s.	n.s.
	Internet – Home	-	n.s.	n.s.	n.s.	n.s.
	Internet – TTC	-	n.s.	n.s.	n.s.	n.s.
	Internet – Other place	-	n.s.	n.s.	n.s.	n.s.
	LCP resources in TTC	-	.252[***]	.212[***]	.210[***]	.113[*]
	Training/workshop/conferences	-	n.s.	n.s.	n.s.	n.s.
	Reading/learning	-	n.s.	n.s.	n.s.	n.s.
	Community of Practice	-	n.s.	n.s.	n.s.	n.s.
Knowledge	Pedagogical knowledge	-	-	.366[***]	.338[**]	.274[**]
	Tech.-ped. knowledge	-	-	n.s.	n.s.	n.s.
Attitude	Construction of knowledge	-	-	-	n.s.	n.s.
Practice	Cooperation and sharing	-	-	-	-	.315[***]
	Use of ICT for teaching	-	-	-	-	n.s.
	Use of ICT for student learning	-	-	-	-	.119[*]
Adjusted R^2 'Student engagement with LCP'		.061	.166	.302	.298	.463
F Change		2.621	2.547	3.983	3.766	5.860
df1		5	16	18	19	22
sig. F Change		.028	.002	.000	.000	.000
Note – Not included in model, n.s. not significant, [*] $p < .05$, [**] $p < .01$, [***] $p < .001$.						

The final model explains 46.3 % of variance in the dependent variable. The factors contributing the most to the explained variance in the uptake of LCP in the final model remain *availability to LCP resources in the TTC*, *pedagogical knowledge*, *cooperation and sharing amongst colleagues* and *use of ICT supporting student learning*.

Training needs

Table 15 indicates that respondent tutors claim for trainings in topics that reflect learner-centered pedagogy. More specifically tutors need training in facilitation techniques (89.90%) to be applied in their teaching practice, use of technology to facilitate leaner-centered methodologies (82.30%) and research skills and practices (action research): 89.5%. Although, respondents declare or keep neutrality with regard to some topics such as coaching strategies in line with learner-centered teaching practice and use of technology to collect and analyze students' assessment data to be irrelevant for them, it is believed that these themes are required in the contemporary program for teacher professional development.

Table 15: Training needs assessment

Training needs			entirely irrelevant	irrelevant	neutral	relevant	entirely relevant
Q10: Would prof. dev. on the following topics be relevant to you …	M	SD	%	%	%	%	%
(1) Theoretical background and research on learner-centred pedagogy.	4.02	0.862	1.40	5.10	12.10	52.60	28.80
(2) Learner-centred methodologies and teaching strategies such as problem-based learning, learning stations, … that I can apply in my teaching.	4.21	0.811	1.30	2.60	8.60	48.70	38.80
(3) Research skills and practices that I can use in my teaching (action research).	4.23	0.733	0.90	1.40	8.30	52.80	36.70
(4) Identification, location, and evaluation of teaching resources, e.g., learning aids or websites that I can use with my students.	4.09	0.891	0.90	6.00	11.90	45.40	35.80
(5) The use of technology to facilitate learner-centred methodologies.	4.17	0.945	1.40	6.40	10.00	38.20	44.10
(6) The use of technology to collect and analyze student assessment data.	3.98	1.002	0.90	10.30	14.50	38.30	36.00
(7) Ways to use technology to communicate and collaborate with other educators and students.	4.09	0.966	1.80	6.30	12.60	39.50	39.90
(8) Coaching strategies in line with learner-centred teaching practice.	3.91	0.984	1.40	9.30	17.10	41.70	30.60
(9) Assessment strategies in line with learner-centred teaching practice.	4.12	0.816	0.60	4.50	11.20	50.30	33.50
(10) Training and facilitation techniques that I can apply in my teaching practice.	4.31	0.780	1.40	1.40	7.30	45.20	44.70

Conclusions

In the framework of a cooperation between URCE and VVOB a baseline and training needs assessment study took place to assess the existing situation with regards to the uptake of LCP in teacher education in Rwanda and the interplay between factors influencing or hindering the uptake of LCP. 228 tutors in 13 TTCs completed a self-report questionnaire consisting a series of items assessing different factors such as access to ICT and resources, professional development opportunities, conceptions of learning, and uptake of LCP in their teaching practice. It is important to note that there are obvious limitations to a self-assessment as it is clear that such assessments often lead to social desirability and overestimation. Nevertheless, the analysis on the data does show some interesting trends and also relations between the different factors that have been assessed.

It is clear that the current status of availability and accessibility to ICT tools (computers in the present report) is limited and less satisfactory for the majority of respondents. Most tutors rely on the TTC equipment and have poor access to computers and the internet at home. From field observations it is moreover clear that access to ICT in the TTCs is in itself insufficient. The number of computers in TTCs varies between 10-20 computers; and these are exploited by 200-400 users (school administration, tutors and students included). Tutors access some facilities such as internet in other places like in cyber cafés. It is unclear whether they access computers and the internet for preparing lessons or more likely for social networking. Their economic conditions, like for other teachers in Rwanda, would probably not allow them to spend long periods in internet cafés (Nizeyimana & Osman, 2013; Nzabalirwa & Nkiliye, 2012). It can be concluded that ICT tools are not playing a significant role in supporting the teaching and learning, nor in enhancing cooperative learning, cooperation and sharing of knowledge and experience, independent learning, and project or problem-based learning. In addition, tutors also do not have a lot of access to the projector in the college, while this device can be most useful in visualizing what is being taught and learnt, according to didactic principles of concretization, facilitating and thus students' learning. Concerning with other LCP resources, self-study materials, training materials, good practices, library/resource centre, and online and searchable open resource centre are available in TTCs but not sufficiently. The insufficiency of LCP resources is likely to handicap the smooth running of the

teaching and learning activities. In addition, the question still remains to ensure whether these existing resources are adequately exploited.

It is believed that teaching practices are largely directed and influenced by the learning theories. Moreover, students' approaches to learning influences teachers' approaches to teaching (Morgan, Gibbs, & Taylor, 1980; Prosser & Trigwell, 1999). Regarding the conceptions of students' learning, tutors' views are diverse. Some tutors have a conception of learning as intake of knowledge whilst others take students learning as construction of knowledge. Tutors who perceive student learning as knowledge construction are in line with the overall education reform in African countries, Rwanda included, to integrate learner-centered pedagogy into the teaching and learning process. Nevertheless, there is still a significant percentage of tutors who stayed neutral on some questionnaire items on learning conceptions, which might indicate that they are less knowledgeable about this type of learning conceptions.

Present findings show that the majority of tutors participated in professional development on LCP, but that there is less participation in communities of practice. A significant percentage of tutors still did not attend any training/workshop or conference, nor did any reading or personal learning on the topic of LCP. And as is also shown in the findings related to cooperation and sharing, there is little routine in regular sharing of experiences of tutors'.

The majority of tutors participating in this study affirm to have the pedagogical knowledge that is required for an educator to efficiently plan and manage the classroom, adapt teaching to learners' characteristics and assess their performance. In addition they recognize the capability to choose and utilize technology to enhance students learning. Nevertheless, the respondents are more critical towards their own technological-pedagogical knowledge.

Research based-findings showed that there is often big gap between what teachers affirm to know about learner-centered pedagogy and what they practice in classroom (Barrett et al., 2007). Concerning perceived engagement of students in LCP, respondent tutors argue that they engage their students in active teaching and learning (ATL), especially in well-known approaches such as group work. However, a portion of tutors never engage their students in innovative and transformative approaches such as project-based or independent learning. When it comes to the use of ICT for teaching and support of student learning, most tutors do not report a regular uptake of the different suggested applications such as presentation tools, or word processing tools, or electronic communication with students.

Multiple analysis regression revealed that factors contributing the most to the explained variance in the uptake of LCP are availability to LCP resources in the TTC, pedagogical knowledge, cooperation and sharing amongst colleagues and use of ICT supporting student learning.

Discussion and recommendations

It is clear that even though tutors claim to have the pedagogical knowledge and that they do apply more well-known learner-centred methods and techniques in their teaching practice, it is still recommended to engage these tutors in professional development on LCP and especially in reflective practice. The findings show that there is still a significant proportion of tutors that does not engage regularly in professional development in general and cooperation and sharing amongst peers in particular. To bring their pedagogical knowledge further into practice, and to transform their teaching practice by application of innovative approaches to teaching and learning, a **more profound insight in the foundations of LCP** and a **hands-on training on methods and techniques** such as problem-based and project-based learning, field work or techniques such as brainstorming and shared writing is recommended. Engaging students in active learning experiences such as project-based and independent learning approaches helps them to think for themselves as well as to move away from the intake and reproduction of knowledge towards the creative production of knowledge; thus becoming critical thinkers and creative problem-solvers so that they can effectively deal with contemporary challenges (King, 1993).

A mechanism intended to help tutors improve their knowledge and skills in learner-centered pedagogy should be put in place. Apart from input on pedagogical knowledge, the power of cooperation and sharing is very obvious. Professional development on LCP should therefore not stop after an input session on LCP. It is recommended to

engage tutors in follow-up practice, in which they apply what they have learned in their own practice and share with their colleagues and peers. Additional trainings, dissemination workshops and lesson observations are obvious channels for **cooperation and sharing** knowledge and experience among tutors. Many researcher and educationalists (e.g. Cambridge, Kaplan, & Suter, 2005) argue that participation in **communities of practice** stimulates learning by serving as a vehicle for authentic communication, mentoring, coaching, and self-reflection on individuals' actions.

Finally, it is obvious that tutors should **have access to relevant and sufficient LCP resources**. Apart from providing and compiling a basic set of training and self-study materials, tutors can be engaged in the development of such resources themselves and in sharing these resources in libraries and open resource centres in the TTCs. Engaging students in the use of ICT and the **use of ICT to support student learning** also contributes significantly to the uptake of LCP. According to UNESCO (2008), today's classroom teachers need to be prepared to provide technology-supported learning opportunities for their students. Being prepared to use technology and knowing how that technology can support student learning have become integral skills in every teacher's professional repertoire. Even though access to ICT and LCP resources in general is limited, it is recommended to address the use of ICT and the full use of available resources in a professional development programme on LCP. Since the majority of tutors still use shared computers at school, it is advised to sufficiently equip TTCs with enough computers and next to that facilitate tutors to acquire their own laptops so that they can continue their work at home.

As tutors request for trainings in various aspects of learner-centered pedagogy, the above mentioned themes would be part of their professional development. Like any other profession, tutors need to keep updated about innovative trends that are occurring in educational systems so that they can cope with changes and adapt their practices accordingly. By engaging tutors in the TTCs in LCP, the professional development programme will contribute to shaping student teachers' identity that fosters learner centeredness in their future profession, which is at primary school level. In addition, the initial teacher training curriculum should also precise teaching approaches that reflect current theories and approaches of learning, which make students more responsible for their own learning, cognition and thinking: constructivism, metacognition, self-regulated learning.

This study is largely based on tutors' self-reported attitudes, knowledge, skills and practice related to LCP. It is clear that this data has to be complemented with classroom observations and evaluation of teaching practice in classroom settings. Nevertheless, this study gives a clear idea on the relations between different conditions and factors influencing or hindering the uptake of LCP and of the training needs of the tutors in the TTCs.

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Annex 1: Description of self-report questionnaire scales

Non-manipulative variables

Main teaching subject, gender, years of experience, age and a question on where the respondents teach (TTC) are all included in the questionnaire. These variables are non-manipulative. Hereafter we describe the factors that can be addressed in the framework of the TTE project and are therefore manipulative variables.

Access to ICT & availability of LCP resources

Given the particular context of a developing country, at the beginning of integration of ICT in education, access to computers is measured using the list of ICT Core Indicators, developed by the Partnership on Measuring ICT for Development, an international, multi-stakeholder initiative to improve the availability and quality of ICT data and indicators, particularly in developing countries (UNCTAD, 2005, 2007). Access to computers can vary: teacher educators may, or may not, have access to a computer in their TTC and when they do have access this may be for their own individual use, or to share with others. Concerning access to the internet, teacher educators may have access both at home and at their TTC, only at home, only in their TTC, or only in other places. The teacher educators were asked as well about access to a projector for use in teaching practice.

In addition, the respondents were asked to give their opinion on access to other resources in their TTC that can support LCP, such as self-study materials, training materials, good practices and a library or resource centre where such materials are available.

Conceptions of learning

Vermunt and Vermetten (2004) define conceptions of learning as a coherent system of knowledge and beliefs about learning related phenomena. They distinguish five conceptions of learning: construction of knowledge, intake of knowledge, use of knowledge, stimulating education, and cooperative learning. In this study only two conceptions of learning are assessed and included in the questionnaire, due to pragmatic reasons: 'Construction of knowledge' and 'Intake of knowledge'. The first refers to conceptions of learning as constructing of own knowledge and insights. Most learning activities are seen as tasks of students. 'Intake of knowledge' refers to conceptions of learning as taking in knowledge provided by education through memorizing and reproducing; other learning activities are seen as tasks of teachers (Vermunt & Vermetten, 2004). Respondents were asked to indicate on a five-point scale the degree to which the described views and motives, in the form of statements, correspond to their educational beliefs.

Participation in professional development

In this questionnaire, there are questions on participation in professional development initiatives, indicating additional engagement. Respondents are asked whether they have participated in workshops, training or conferences and whether they had had read and learned about learner-centred pedagogy and/or integration of ICT in education.

Pedagogical and Technological-Pedagogical knowledge

Schmidt et al. (2009) developed and validated a self-report questionnaire to collect data on teachers' self-assessment of the seven knowledge domains within the TPCK framework. For our research, we selected a 5-point Likert scale on pedagogical knowledge (PK) and on technological pedagogical knowledge (TPK). TPK refers to teachers' knowledge of how various technologies can be used in teaching, as well as their understanding that using technology may change the way that an individual teaches (Schmidt et al., 2009).

Application of LCP

To measure the application of teaching methods, we developed a series of items starting from a mapping exercise by Rwandan education experts on teaching methods being applied in teacher education in Rwanda. In the resulting 4-point Likert scale, the respondents were asked to what extent they let their students take responsibility for their learning, how they let their students cooperate and what teaching activities they let their students engage with. Finally, respondents are asked what how they perceive the use of teaching and learning resources for support of student learning, focusing on innovative uses of ICT by students as defined in Drent and Meelissen(2008).

Use of ICT for teaching purposes

The most robust evidence of ICT use enhancing students' learning is from studies which focused on specific uses of ICT, and clearly identified the range and type of ICT use (Cox & Abbot in Marshall & Cox, 2008). To measure the use of ICT in teaching practice, we use an instrument developed by Peeraer & Van Petegem (2012). This set of questions comprises a 4-point Likert scale on educators' self-reported use of ICT for teaching purposes. The self-reporting measurement instrument answers the need to analyse ICT-based innovations on a continuum, ranging from the assimilation level through the transition level, and up to the transformation level. High scores indicate a more regular use of ICT for teaching practice.

Cooperation and sharing

Similar to the items on the application of teaching methods and techniques and the use of ICT for teaching and support of student learning, respondents were asked on a four-point likert scale the extent to which they cooperate and share with their colleagues and peers, and this in different modalities, i.e. through lesson observation and feedback, research/studies, study visits, work discussions and meetings, etc.