

TEACHER PROFESSIONAL DEVELOPMENT FOR TECHNOLOGY INTEGRATION: LESSONS LEARNED AND NEXT STEPS

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Abstract

The recent acceleration in technological advancement and introduction of interdisciplinary approaches in various areas have brought many exciting new opportunities for applying different hardware and software in schools and educational institutions. Along with the potential to revolutionize teaching practices, however, the constant influx of new technology poses a serious challenge to long-term efforts for developing teachers' skills and competencies for using technology in the classroom. Technology professional development programs need to be flexible and to include possibilities for adding new content and methods, and even for introducing changes in their format and form of delivery. This paper presents an overview of the developments in offering teacher training for information and communication technology (ICT) skills and for integrating technology in a learner-centred classroom within the Intel Teach Program in Germany. The program in Germany evolved from a face-to-face training for ICT skills and for basic use of technology to an advanced course in a blended-learning format focusing on methodological competencies for integrating new pedagogies and technologies, which shifted toward open source solutions with a Moodle-based online platform in 2010. Results from an external evaluation of the courses, an investigation of the factors for effectiveness and sustainability of the program and a follow-up study five years after the end of the initial course, reveal some tendencies in teachers' needs for professional development in ICT skills and integration, as well as insights into the conditions for achieving positive effects on teaching practices in terms of technology use, implementation of learner-centred methodologies and teaching quality.

Keywords: Teacher professional development, technology integration, technology-enhanced learning, online platform

1 INTRODUCTION

The recent acceleration in technological advancement and introduction of interdisciplinary approaches in various areas have brought many exciting new opportunities for applying different hardware and software in teaching and learning. Along with the potential to revolutionize teaching practices, however, the constant influx of new technology poses a serious challenge to long-term efforts for developing teachers' skills and competencies for using technology in the classroom. In order to cope with the dynamics in the field of education technologies, technology professional development programs need to be flexible and to include possibilities for adding new content and methods, and even for introducing changes in their format and form of delivery. At the same time it is necessary such programs to be sensitive to teachers' needs, which are not always developing in parallel to technological innovations in education. This paper presents an overview of the developments in offering teacher training for information and communication technology (ICT) skills and for integrating technology in a learner-centred classroom within the Intel® Teach Program in Germany. Results from the external evaluation of the courses, an investigation of the factors for effectiveness and sustainability of the program and a follow-up study five years after the end of the initial course, reveal some tendencies in teachers' needs for professional development in ICT skills and integration, as well as insights into the conditions for achieving positive effects on teaching practices in terms of technology use, implementation of learner-centred methodologies and teaching quality.

2 INTEL TEACH PROGRAM IN GERMANY

The teacher professional development program Intel Teach is part of the Intel® Education Initiative of Intel Corp. towards advancing education through the use of technology. The program is aimed at

training classroom teachers to effectively integrate technology in instruction to enhance student learning. The program provides courses targeting different aspects of integrating technology in classroom teaching to elementary and secondary school teachers. The set of courses comprises of: *Getting Started Course*, introducing classroom software productivity tools and student-centred approaches to learning; *Essentials Course (face-to-face or online)* on how to integrate technology into existing classroom curricula to promote student-centred learning; *Thinking with Technology Course* - modular training how to use online tools to enhance students' higher order thinking skills; *Advanced Online Course* for further advancement of teachers' methodological skills and for forming teacher communities; and *Elements*, series of short courses on 21st century learning concepts, such as project-based approaches and assessment in 21st century classrooms. Further courses include *Skills for Success* for ICT teachers based on a student curriculum that develops digital literacy, problem solving, critical thinking and collaboration skills and *Leadership Forum* for school leaders, focused on promoting, supporting and implementing effective technology integration in schools. Different modules of the program have been implemented in over 50 countries around the globe since 1999. In Germany the program started in 2000 with the offering of Intel® Lehren – Grundkurs (basic course). In 2004 the Intel® Lehren – Aufbaukurs Online (Intel Teach - Advanced Online) course was designed in Germany and implemented to offer professional development in a blended-learning format through an online platform and to emphasize methodological competencies for integrating new pedagogies and technologies. In 2010 a shift toward open source solutions resulted in launching a new offering under the name Intel® Lehren Interaktiv (Interactive), which implements the main features of the advanced course through a new, Moodle-based online platform, integrating more functions for teacher interaction with the platform and among themselves.

2.1 Teach to the Future (Grundkurs)

Developed by the Intel Corporation and the Institute for Computer Technology, the course has been implemented in a number of countries around the world since 2000. The course was adapted and localised by the Academy for Teacher Professional Development and School management (Akademie fuer Lehrerfortbildung und Personalfuehrung, ALP) in Dillingen for the specific conditions and requirements in Germany [1].

The course employed a train-the-trainer model, through which Master Teachers received training to train and support their peers within their school districts. The course consisted of instruction delivered in forty-hour face-to-face instruction, in modular form. The participants were stimulated to implement the knowledge from the course in their teaching in school. This was realised through a project, in which teachers – individually or in teams – prepared lesson plans for using in class the software they were learning about. The best projects were collected in a database for use by other teachers. The course was designed to ensure that teachers are equipped to integrate technology into a standards-based curriculum in order to improve teaching and student achievement. Teachers participating in the initial course learned the pedagogy that supports effective integration of technology into the classroom and then learned how to develop materials and teaching strategies that translate those principles into effective learning opportunities. Each participant in the program drew on his or her own existing curriculum to develop a technology-rich unit plan over the course of the training. This process allowed participants to act immediately on what they were learning, and to work in a collaborative manner with other teachers to refine their plan and solve instructional and technical problems as they arise.

The course was implemented in all sixteen federal states in Germany. It allowed to be integrated in existing structures for professional development in the different federal states, which lead to various concepts for the realisation of the course locally. Thus, in some states the course was used as a basic course in computer literacy, whereas in others it was used for advanced professional development of teachers with prior ICT training. Due to the difficulty level of the course for novices in the area, in some federal states an additional basic course was offered. The course was organized in various formats, e.g. as block seminars, as weekend-sessions, as weekly course during the week or on Saturday.

In 2004 a new offering within Intel Teach was launched – Intel Teach – Advanced Online. By the end of 2004, after more than 200 000 teachers in Germany completing the initial basic course, more than half of the federal states discontinued it [1]. In specific cases the course was offered again later, or implemented in a mixed variant together with the advanced course.

2.2 Intel Teach – Advanced Online (Aufbaukurs)

The program Intel Teach - Advanced Online (Intel Lehren – Aufbaukurs Online) was designed in Germany and launched in 2004 after the successful implementation of the first Intel course. The concept for the advanced course was developed by the Academy in Dillingen belonging to the Ministry of Education in Bavaria, Germany [2]. The academy assured that the content of the program matched the curricula in all federal states and fostered the cooperation with various public education institutes.

The program was based on a blended learning format of face-to-face meetings and individual and collaborative learning supported by an online platform, which enabled self-paced on-the-job professional development. The “train-the-trainer” approach enabled a high degree of support, through the presence of mentors in the schools and communities of the participants in the program. Participants in the program were guided and assisted in the training process by mentors (Master Teachers). A typical course of the program was initiated by an interested teacher, who received training to become mentor and presented the program to his or her colleagues in the school. Teachers, who decided to participate in the program, formed one or more groups. Supported by the mentor they chose a pedagogical approach or technology tool to learn about, and subsequently worked collaboratively to develop a unit plan, implement it in their classroom practice, evaluate it and enhance it for further use.

This pedagogical framework is called ‘Learning Path’. Every learning path is either driven by its pedagogical approach or by the application of specific technology, e.g. data handling and data analysis; using ICT to allow students to work collaboratively online. The intended distribution of time for completing a Learning path is 8 hours for introduction to the concepts, methods and technology, 12 hours for working on a Learning path collaboratively with other teachers, and 20 hours of individual learning using the available online resources and tools.

The online platform was design to support and drive all steps in the process and includes several main areas to suit personalized needs at a particular time: areas for work with the learning path and areas with resources, collaborative tools, additional information and online support. Using the training platform is flexible and teachers have the choice to participate in the training from home or from school, depending on their preference and technology availability. Teachers also can access the platform after they have completed the program and use the available resources, ideas, unit plans and materials for self-directed learning.

2.3 Intel Teach – Interactive (Interaktiv)

After the successful implementation of the program Intel Teach - Advanced Online, it is being currently expanded and transformed into an offering, which provides more opportunities for collaboration and for integrating teacher contributions to the program. Intel Teach Interactive (Fig.1), which started in Germany in 2010, offers more opportunities for collaboration between teachers, Peer Coaching, and more self-directed professional development based on teachers’ needs. It is organized through a Moodle-based learning management system and it is planned to include Mahara e-Portfolio to support teachers’ professional development. It is expected that through this approach, teachers will not only develop skills for integrating technology in class, but also their social competencies and personality characteristics, such as being more proactive and more responsible for producing educational content and using technologies. The new platform in Germany is available to teachers after registration (<http://www.intel-interaktiv.de>).

3 EVALUATION AND FOLLOW-UP

The implementation of the initial course (Grundkurs) was subject to external evaluation by IBI – Institute for Education in the Information Society, Berlin [1],[3]. In 2009 a follow-up study of participants (n=2820) and master teachers (n=148) in the initial course (Grundkurs) was conducted, five years after the end of the program.

As its predecessor, the program Intel Teach - Advanced Online was externally evaluated to determine the direct effects of the training and to enable continuous improvement and sustainability. In the period from 2005 to 2008 the evaluation of the program was conducted by the Institute for Media and Educational Technology in the University of Augsburg [2],[4]. The evaluation included surveys, interviews and case studies. The main body of data has been collected through an online, self-report end-of-training survey of teachers who completed the program in the period from January 2005 till April 2007 (n=4633) and between May 2007 till October 2007 (n=403) with a total number of 5036

online questionnaires filled out. The survey included items regarding the participants' context (demographics, prior experience and knowledge) and concerning teachers' assessment of the online platform and of the provided resources, learning content, tools and support. Further questions explored teachers' assessment of the learning process, of the gained competencies and other outcomes, as well as their attitudes toward using digital media in professional development. Self-report surveys have been also filled by mentors (n=152) online, and by teachers (n=418) and university students (n=67) at the educational fair Didacta 2006, whereas the "senior teachers" of the program (n=14) filled open questions regarding the conditions of implementation.

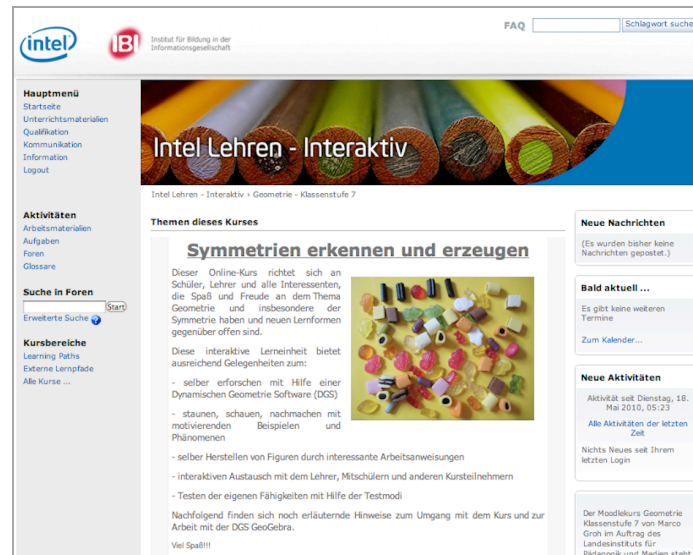


Figure 1. Moodle-based platform of the program "Intel Lehren Interaktiv" in Germany.

In 2007 the Institute for Media and Educational Technology in the University of Augsburg conducted case studies of sixteen schools in four federal states in Germany [4]. The method involved group discussions with teachers who participated in the program (n=40), and with teachers who did not participate in the program (n=24), as well as individual interviews with school principals (n=15), aiming to identify the main factors for the sustainability of the program and its successful implementation. The interviews and group discussions were analysed by school and federal state, resulting in categories and sub-categories of the factors [4]. The "senior teachers" were also involved in the evaluation through group discussions and written comments, providing an additional perspective to the interpretation of certain factors.

The evaluation concept, method and findings are discussed in detail in reports and published materials of the Institute for Media and Educational Technology in the University of Augsburg [2],[4], which are available online.

4 LESSONS LEARNED AND NEXT STEPS

Based on the results from the evaluation and follow-up studies, reported and discussed in detail in the evaluation reports and in discussions of different aspects of the program, some conclusions can be drawn about what has been learned from the implementation and evaluation of the program so far, and what can be done for improving the current offering.

4.1 Impact of the initial course

4.1.1 *Well-designed training in the use of ICT has a long-term positive impact on teachers' skills, attitudes and practices even if delivered in the format of longer seminars or weekly sessions.*

The evidence from interviews and surveys of the participants in the initial course indicated that the program had a highly positive outcome. Most teachers reported that they had improved significantly

their skills for electronic text editing, for using presentation software, for Internet research, or for developing websites. Teachers were motivated by the course to change their pedagogical concept.

The findings of the follow-up survey five years after the end of the initial program indicated high interest in and satisfaction with the course. More than two-thirds of the participants were satisfied with their outcomes from the course and reported that digital media played a more significant role in their class preparation after the course. Half of the teachers indicated that they used digital media more often in class after completing the course. According to Master Teachers, participants in the initial course by Intel used more often digital media in class and for class preparation compared to teachers who did not participate in the course. More than two-thirds of the participants reported improvement of their teaching quality in terms of more current, individualized and differentiated content in instruction. Less impact on the teaching quality was reported for the areas of project-based teaching, learner-oriented and active learning, and use of communication and collaboration platforms.

4.1.2 Teachers are interested in more training or professional development opportunities in the use of ICT, integrating subject-specific applications and didactical skills

In regard to further training in technology integration the majority of the teachers indicated that they would participate in another intensive training for integration of digital media in teaching, with preferred focus on subject specific and general didactical skills for integrating technology in teaching, as well as use of specific applications. Preferred format of training is on-the-job in school, longer-term training, in blended-learning format.

4.2 Design and effectiveness of the advanced course

4.2.1 Blended learning format of professional development combining face-to-face and online individual and collaborative training with an online platform with resources and tools is well accepted by teachers.

Teachers' feedback about the program was highly positive. The majority of the participants were satisfied with it and would recommend it to other teachers. Teachers also approved e-Learning as approach for professional development and reported that they profited from the e-Learning components of the course. Collaboration among teachers in school was considered important by most of the participants and in the average teachers spent twelve hours in collaborative work with their team, compared to 16 hours of individual learning and 10 hours of implementation of the developed unit in the classroom. The design of the platform, the quality of the content and the methodological approach of the Learning path were rated high. Over two-thirds of the participants found the role of the mentors in the program important and were satisfied with the mentor support they received.

4.2.2 Blended learning format of professional development combining face-to-face and online individual and collaborative training with an online platform with resources has a positive effect on teachers' technical and methodological competencies and on students' motivation, participation and skills.

According to the self-assessment of the participating teachers, the program improved their technical and methodological competencies for using digital technology in instruction. As result of their participation in the program teachers declared to have a lot of new ideas to use digital media in teaching, and increased their confidence to use new media in the classroom, their appreciation for self-evaluation and collaboration as part of the teaching practice. Increased motivation of the students was among the most frequently reported positive effects from applying digital media in class in combination with learner-centred approaches. Teachers also reported higher interest and participation of students in the lesson. Less effect is seen on students' active learning through generating more own ideas to reach the objectives of the lesson and raising questions. However, teachers reported increase in students' support and self-organization during team learning. Improvements in students' skills for digital media use were also indicated by the majority of the teachers.

4.3 Teachers' attitudes toward technology

4.3.1 Multidirectional links exist between teachers' prior experience, attitudes, their interaction with the online platform, mentors and colleagues, and competence gains.

The findings of the program evaluation point at multidirectional links between teachers' prior experience, attitudes, their interaction with the online platform, mentors and colleagues, and

competence gains. Positive attitudes toward technology and e-Learning were related to higher rating of the program, the online platform, competence gains and experience, however, the evaluation findings do not provide base for drawing causal directions. Here, findings from the case studies provide a clearer view of the possibilities for influencing positively both teachers' attitudes and outcomes. Firstly, communicating the character, prerequisites and outcomes of the program in a more clear way and to a broader audience of teachers and school principals can have a significant positive effect. Similarly, the example of tutors and participant teachers and their attitude and satisfaction with the program has a strong influence on the interest of teachers, who have not participated in this professional development offering. Strengthening the presentation of the program to teachers with demonstrations of the learning process and the available resources and support will be beneficial. The importance of effective teamwork during participation in the program can also be capitalized on, through improving the conditions and support for collaborative work within the program design. The possibilities for improving the conditions for implementation of the program are of great significance in the context of high demand for increasing teachers' technology-related competencies and attitudes.

4.4 The role of collaboration

4.4.1 Facilitating effective collaborative work with other teachers can improve teachers' competences gains from professional development and their teaching practice.

The analysis of the evaluation data showed a strong impact of effective collaboration on individual gains from participation in the program. When collaborative work with other teachers was successful, teachers reported higher competence gains compared to the cases in which the collaboration did not work well. More than two-third of the teachers report increased readiness for collaborative work and learning after the program. Many teachers had already participated in collaborative activities with other teachers before the program. Particularly high percentage of teachers had already collaborated with colleagues in order to prepare themselves for classes or had taught interdisciplinary. Over two-thirds of the teachers reported collaborating with other teachers more often as result of their participation in the program. Collaborative learning seems to be an important component of successful professional development, particularly effective teamwork and sharing practices with other teachers. The evaluation findings showed that teachers not simply completed the program, they also used intensively the opportunities for collaboration with other teachers. The findings show that after receiving their certificates nine out of ten participants continued to use the online platform and more than two-thirds continued to work with their teams on other learning paths.

4.4.2 Online tools for collaboration do not necessarily add value in teachers' school-based work, where face-to-face interaction is possible. Establishing an online learning community within a professional development program requires the participants to be engaged in relevant tasks and activities.

Despite the functions embedded in the online platform to support between-school teams through online communication and collaboration, such interactions were not realized due to the implementation of the program Intel Teach – Advanced Online as a school internal training in 83% of the cases. Therefore is it not surprising that the online collaboration tools were not always used. Less than half of the teachers reported that the online-tools “planner/scheduler” and “messages” supported the teamwork. Same observations were made for the online-tools “forum”, “notes”, “whiteboard”, “server for documents”. As interviews and group-discussions (84 teachers were involved) showed, teamwork was based on face-to-face activities. The online-tools for teamwork thus were not essential for the functioning of the team and scarcely used. However, the overall feedback about collaboration within the program was positive. The majority of teachers reported that the teamwork with their colleagues worked out well.

4.4.3 Support from the school leadership and from colleagues is crucial for positive results from technology professional development and can moderate other factors influencing teachers' competence gains and practice change.

The support from the school leadership was a significant moderator of the influence of various factors on the outcomes of the program. Absence of support was associated with poor technical and time resources, disadvantageous school climate and collaboration, and with less prior experience with integrating technology in class. Evidence from the case studies however, revealed that teachers worked in generally supportive school environment with mostly good collaborative work and support from the school leadership. Staff relations, cooperation between colleagues, and support by the school

management are described by the majority of teachers as good. Teamwork was also affected by the organization of the engagement with the professional development. For instance teachers appreciated strict times of meetings, to which all team-members, and additionally the mentors were present. For this purpose in some cases teachers used the times scheduled for meetings of teachers of their discipline. Although teachers with positive experience from the collaboration with their colleagues benefited more from the program, this was not only related to their readiness and competencies for collaboration, but also to the provision of time for teamwork by the school. Here the role of the school leadership is central, and it needs to support the objectives of the program and to recognize the involvement of the tutors. The school management supported the implementation of the advanced course by ensuring that the technical requirements were met, by providing time for an exchange of ideas and facilitating innovative teaching, by including system support staff and departmental heads or by respecting method and media competence of the teaching staff in the school's profile. The successful implementation of the professional development was also linked to positive experiences with the collaborative work with other teachers, good organization of the team work and time for teamwork, teachers' acceptance of the didactical concept, perceived learning gain, engaging in reflection on own teaching and experiences with the added value of digital media in teaching.

4.5 Factors for the implementation of the course

4.5.1 Available time, good technical infrastructure, mentor support and prior experience can improve the rate of successful participation of teachers in technology professional development.

Teachers report generally supportive school environment with mostly good collaborative work and support from the school leadership. Less positive are the technical and time resources with less than half of the participants being satisfied with the technical infrastructure in their schools. The effectiveness of the training was also related to the availability of support by mentors, by colleagues in the team and by the school leadership. Teachers were more successful with the program also when they had more experience with e-Learning and with using technology for teaching, and when they spent more hours on their learning and work within the program.

Good experiences with the prior basic course for technology use offered by Intel, deepening of the already acquired competencies and inclination to and interest in digital media positively influenced the sustainability of the program. Sufficient time for use of digital media and solutions for handling class size, as well as prior knowledge, skills and interest of the students in learning with digital media were also identified as positive factors.

4.5.2 Aligning a program with the objectives of professional development in a particular place at a particular time is crucial for the impact and long-term implementation of a program.

Further advantages came from information and motivation of the teachers, alignment of the program with the objectives of the school focus, and participation of a higher proportion of teachers from the school in the program. In relation to the school policy advantageous factors for the sustainability of the program were digital media as a component of curriculum and lesson plans, autonomy of the schools, external evaluation for quality development, and demand due to professional development requirements. The impact and long-term implementation of the program are higher when the program is aligned with the objectives for professional development, uses flexibility and creativity, mentors integrate different functions and are well prepared, teachers are well informed about the program, the group of teachers not interested in technology is also reached, the program is recommended by other teachers on the base of positive experiences and is presented to teachers in a stimulating way through content.

4.5.3 Lack or insufficient experience with digital media, lack of interest in the objectives of the program, uncertainty of the benefits from the program, low relevance of the certification for career advancement and lack of tutors impact negatively the implementation and results of a program.

Factors with negative effect on the sustainability of the program were the lack or insufficient experience with digital media, lack of interest in the objectives of the program, uncertainty of the added value of the program, and low relevance of the certification for career advancement. Further hindering factors are the low value of digital media in teaching, workload due to restructuring of the

work and search for training limited to needs. The program implementation was affected negatively also when the objectives of the program did not represent current school policy of the federal state, mentors were not in sufficient number, or the frequency and place of presentations of the program in front of teachers was regulated only by demand and not supported sufficiently by staff.

4.6 Next steps

The external evaluation of the program Intel Teach Advanced Online showed that collaborative professional development for teachers in integrating technology in class is beneficial, however, in the conditions of school internal training, teachers show clear preference for the face-to-face interactions, rather than using online collaboration tools. It is not clear whether a different form of implementation or organization of the professional development process will facilitate more intensive and productive use of online collaborative tools, or whether it would have advantages over face-to-face collaboration. This question will be addressed in the context of the new program supported by a Moodle-based version of the online platform, which provides opportunities for more interaction and contribution to the program content resources.

In addition, there has been no exchange between participants of different schools in the advanced course. It should be considered how a requirement for networking can be incorporated into the didactic concept and supported by the online platform. It would be possible, for example, to have joint preparation of content, as part of the certification, by means of social software such as wikis or weblogs. Likewise, schools might offer their experiences of implementing innovative projects to other schools in a kind of "exchange forum", e.g. by acting as consultants and in exchange receiving consultancy services from other schools for the implementation of other projects.

After revision of the significance of collaboration between teachers and the influence of tutors, a different concept is implemented in the new version of the program – peer coaching. It is expected that this additional support will enhance teachers' acquisition of competencies and skills, according to their individual needs. This can also be addressed by the introduction of e-Portfolios as part of the professional development, as a mechanism to identify gaps, track development and find peers with relevant knowledge and skills for coaching and collaboration. Further possibilities for interaction between teachers and for forming a virtual community of practice or community of professional learning will contribute to the impact of the program on teaching practices and on the sustainability of the program. The last suggested elements have been implemented in the new version of the program and their effect will be examined in the coming months.

5 CONCLUSION

In summary, the implementation and outcomes of the Intel Teach - Advanced Online program provides some insights about addressing the challenge for schools and teachers to keep up with technological change. The findings of the evaluation of Intel® Teach - Advanced Online confirmed the benefit of using an online platform to support design principles identified as effective within a blended form of teacher professional development. It appears that such offering is a viable tool for addressing the concerning deficiencies in Germany in terms of teacher attitudes and competencies. The platform was accepted and used as resource for theoretical and practical content, example materials and for sharing developed materials.

At the same time the findings based on teachers' self-reports need to be accepted with caution. For instance, despite the teachers' reports for increased collaboration as result of the participation in the program, according to Senior Teachers collaboration between teaching staff had barely improved. In the absence of objective measures in this case, it should be pointed out that the reported findings relate to how teachers perceived their work within the program and the effects from it, rather than actual processes and outcomes.

Identifying the factors, which contribute or on the contrary, impede the sustainability of a professional development program, allows to draw a comprehensive outline of the beneficial external conditions which can be strengthened, and the negative conditions which can be improved. Although certain elements of the specific context in Germany, such as federalism and large differences in regional policies and practices, cannot be changed, some factors in the area of concept transfer and on school level can be easily influenced in order to improve the sustainability of the program and its further implementation. Firstly, communicating the character, prerequisites and outcomes of the program in a clear way and to a broader audience of teachers and school principals can have a considerable

positive effect. Similarly, the example of tutors and participating teachers and their attitude and satisfaction with the program has a strong influence on the interest of teachers, who have not participated in this professional development offering. Strengthening the presentation of the program to teachers with demonstrations of the learning process and the available resources and support can increase teachers' interest and participation rate. However, the exact way to realize that in a way accepted positively by teachers is not clear. Further investigation of teachers' preferences for media and format of such communication and presentation of the program, for instance online or face-to-face, can contribute to the planning of measures for improvement.

Second group of factors, which can be positively influenced, is related to the school organization and the role of tutors and school principals for the successful implementation and maintenance of the program. Actions in this direction can be stimulating more teachers to take the role of tutors through incentives, as well as providing more information to school leadership about the positive findings of the program evaluation about improved teacher competencies, increased use of technology-enhanced learner-centred teaching, and higher student motivation and interest. The importance of effective teamwork during participation in the program can also be capitalized on, through improving the conditions and support for collaborative work within the program design.

In conclusion, it has to be pointed that one of the crucial elements enabling the program to develop and meet current teachers' and stakeholders' need is the external evaluation of the program. The findings from the evaluation provide opportunity for reflection on the program, its implementation and factors for its sustainability and effectiveness.

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