Continuing Education in Quality Improvement for Healthcare Professionals and its Effects on Organizational Improvement Capability

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The purpose of this white paper is to outline the meaning, scope, major concerns, and perspectives around "Continuing Education in Quality Improvement for Healthcare Professionals and its effects on organizational improvement". It is the fourth paper in a series of thoughts collected, organized, and promoted by the Quality in Education Think Tank (QiETT) of the International Academy for Quality (IAQ), for the first time in cooperation also with the European Society for Quality in Healthcare (ESQH).

The first paper addressed a broader scope of topics and put into perspective the overall field of "Quality in Education", which set a common ground for further reflection and guidance of QiETT activities. The forthcoming papers, such as this one, focus around more specific subjects and delve deeper into particular topics based upon the collection of international inputs from quality and education experts:

To date, the collection of white papers comprises the following titles:
"Quality in Education: Perspectives from the QiETT of IAQ"
"Large Scale Training of Quality Professionals"
"Inclusive Quality of Education"
"Continuing Education in Quality Improvement for Healthcare Professionals and its effects on organizational improvement"

Abstract

Healthcare quality is now more than ever before a central issue that societies are facing and will have to face in the future. The critical factors that are related with healthcare quality change from one context to the other, going all the way from assuring basic healthcare assistance to all citizens to providing the best possible solutions, including recent technological developments, while keeping costs and resources under acceptable levels. The most appropriate answers to these challenges will also change from one particular situation to the other; however, we will show in this paper that some common frameworks and patterns can be identified and applied on a rather broad basis. In particular, we will review several studies that clearly identify improvement capability of healthcare organizations as being a major driver for achieving higher and higher levels of healthcare quality. Furthermore, we will describe how meaningful and experiential based continuing education in quality improvement for health professionals can lead to increased organizational improvement capabilities and significant results with regards to healthcare quality. We briefly describe some of such well proven training initiatives, often led by universities, across a number of different countries. Sufficient evidence supporting our conceptual framework of analysis, as well as its practical implications is available. We hope this paper may therefore also inspire additional health professionals and organizations to adopt best practices and achieve significant benefits derived from increased institutional improvement capabilities, appropriately trained professionals in quality improvement and the corresponding identification and implementation of a good portfolio of improvement projects, leading to reinforced healthcare quality and performance.

1. Introduction

While there have been exceptional advances in medicine, there are still considerable challenges that trouble patients, citizens, and politicians. Healthcare expenditures are considered insufficient even though its share of the GNP is increasing above what is considered reasonable for politicians and yet availability and accessibility is inadequate. Aging populations will require even more resources and medical advances have improved possibilities; however, in many cases this has also made treatments more expensive. Further, new challenges are surfacing such as the fear that the current era of antibiotics has come to an end due to overuse and misuse of antibiotics. To cope with all these challenges, system wide improvements are needed. We will not go into detail on all the challenges of the healthcare system but conclude that there is a need for the healthcare systems to renew themselves and be more sensitive to innovation coming both from external sources and from within. However, not all changes and innovations are really improvements to the system (Dixon-Woods et al., 2011) – systematic and total system perspectives on improvement are needed. We need a total system-wide transformation and ongoing improvement of our healthcare systems as indicated in Figure 1, which originated from Batalden and Davidoff (2007).

In this white paper we will focus on the role of education, training, and continuing professional development (CPD) for the utilization of improvement knowledge to achieve healthcare improvement as indicated in Figure 1 (see also for example Bergman et al., 2015). Especially, initiatives provided on an academic level will be in focus.
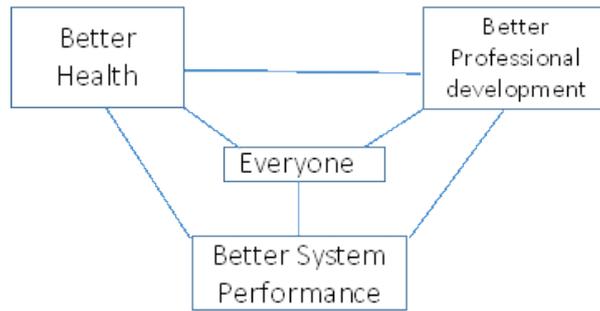
Figure 1.   A general purpose of improvement initiatives should be not only to achieve better health for patients and populations but also to change the system to better its performance for the future. It is important to also improve the professional development (adaptation of an illustration by Davidoff and Batalden, 2007).

Fortunately, we will be able to utilize some recent evidence scans and literature reviews on continuing education, training, and professional development promoting quality improvement. Both The Health Foundation (2012) and the Robert Wood Johnson Foundation (2011) have made scans of the literature in this area. Also, a Cochran report, Forsetlund et al. (2003), on effects from education/training interventions has been published.

After the publication of the above mentioned evidence scans some new perspectives have surfaced, namely dealing with how healthcare systems become better to better themselves. In the general management literature this has a number of different names partly depending upon different traditions: improvement capability (Bessant et al., 1997), performance improvement capability (Adler et al., 2003), innovation capability (Francis & Bessant, 2005), and dynamic capability (Teece & Pisano, 1997). The last concept is somewhat broader but still very relevant.

Accordingly, the remaining parts of the paper are as follows. In Section 2, we summarise the evidence scans and also some papers published after the scans. Next, in Section 3 we will give a brief discussion of the "improvement capability" concept and similar concepts. Then, in Section 4 we will give some indicative cases. Finally, in Section 5, some conclusions and suggestions for future research are provided.

2. Evidence scans

The evidence scan prepared on behalf of The Health Foundation (2012) by The Evidence Centre was based on 367 studies related to quality improvement training/education published between 1980 and 2011 and 60 higher educational institutions and other organizations were contacted for course curricula.

It seems from the results gained that inter-professional training has become more common and that continual professional development training in quality improvement is growing at a faster speed than the corresponding university education. Also, practical training in the form of improvement projects has become important as a means to practice what has been learnt. They also report that they have found geographical differences in approaches; for example, that in the US quality improvement is mandatory for medical students (see also Armstrong et al., 2012) while that is still not the case in for example the UK. However, since 2012 there are strong trends towards a change in the same directions at least in Northern Europe. In the evidence scan it is also noted that there are some geographical differences in the content of training programs - more standardised in the US while less so in Europe.

The Health Foundation (2012) report concluded that, while there are considerable papers discussing the content of courses on quality improvement, there is less information about the impact of training and which content and training methods are the most useful. They indicate, however, that quality improvement put to practice is more effective than only theoretical classroom exercises. Also, the importance of training the trainers is emphasised.

Their final conclusion (The Health Foundation, 2012, p5) is that:

> "*...a great deal remains uncertain about training in quality improvement, including: the most appropriate content; how training can best be delivered to improve processes and patient outcomes; how to measure and ensure quality within training.*"

These conclusions are very much in line with those provided in the concurrent scan conducted by the Robert Wood Johnson Foundation (2011).

In a non-systematic follow up of the results of the above evidence scans some new information has been achieved. Reports on successful training/education initiatives on QI occur more frequently (see for example García-Pérez & Gil-Lacruz, 2018; Ogrinc et al., 2016; Lifvergren et al., 2011). This also provided results that are important to understand shifting degrees of success – barriers as well as success factors (Eid & Quinn, 2017). This paper studied how residents transferred the learning from the training to their continued everyday work and factors that affected this transfer. The factors identified were of three main types: the trainee characteristics, the training course and the work environment. These factors are illustrated in Figure 2, from Eid & Quinn (2017). The importance of a multifactorial phenomenon when assessing training effectiveness is here illustrated, with further information available in the referred paper. A further perspective on this is given by Babich et al (216) that give arguments for the importance of an organizational strategy emphasizing a structure for improvement work – quality improvement training is not enough!

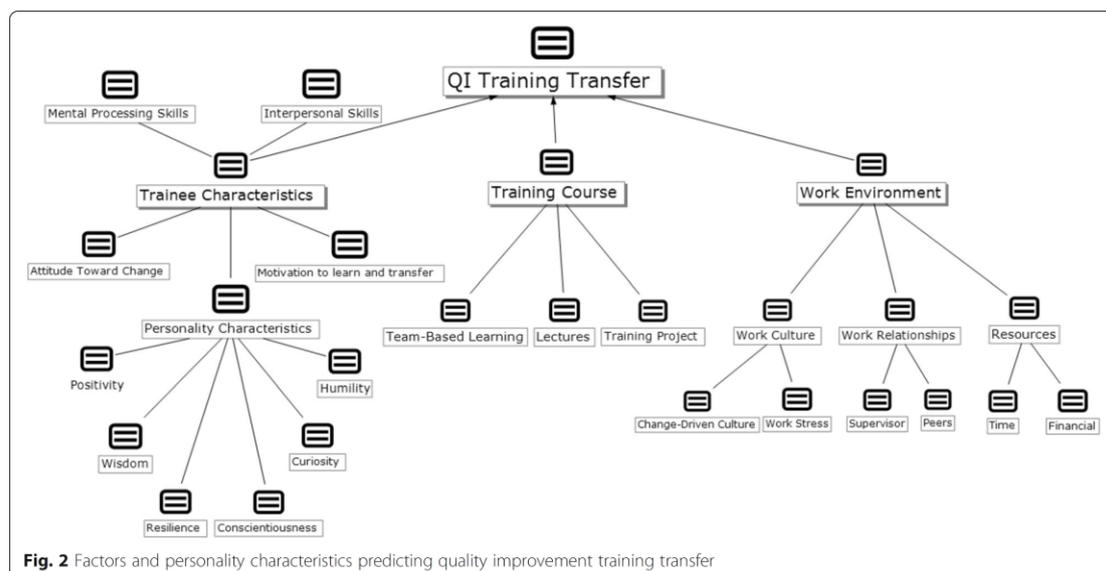**Fig. 2** Factors and personality characteristics predicting quality improvement training transfer

Figure 2.   Not only the course content is important but also characteristics of trainees and work environments are also important (adopted from Eid & Quinn, 2017).

Furthermore, there has been a much stronger emphasis on the development of methods to assess training effectiveness (see for example Eva et al., 2016).

In the recent literature on continuing education, training, and professional development another "new" perspective has appeared: the organizational improvement capability (see for example Agwunobi & Osborne, 2016 and Furnival et al., 2017). Even though it has been in focus for a long time in the general management literature, its importance for healthcare management has become more clearly expressed lately. We will discuss this perspective in the next section in more detail.

In the Health Foundation (2012) scan some examples of formal education on quality improvement and examples of continuing professional development were given. A number of universities give courses and programs on healthcare management and improvement, and the report mentions for example Newcastle University, University of Birmingham, The University of Sheffield, etc. However, in this White Paper we will rather focus on education and training initiatives directed towards professionals (Table 1), with several initiatives also being available in this field.

Table 1. Examples of continuing professional development initiatives

Provider	Course(s)/program(s)	Ref
Open University School of Health and Social Welfare	**MSc in Advancing Healthcare Practice**; a programme that contains a quality Improvement module and a project that is of immediate and clear benefit to stakeholders in healthcare	http://www.openuniversity.edu/courses/postgraduate/qualifications/f52#entry-requirements
Institute for Healthcare Improvement	A number of open on-line courses on Healthcare improvement, Patient safety and leadership	http://www.ihi.org/Topics/ImprovementCapability/Pages/Education.aspx
Dartmouth Institute Micro-System Academy	**The team Coaching Program;** a foundation for coaching inter-professional improvement teams	http://clinicalmicrosystem.org/knowledge-center/curriculum
Jönköping Academy for improvement of Health and Welfare	**Master's Program in Quality Improvement and Leadership of Health and Welfare; "…**the first two years which are run at half pace, are mostly theoretical studies connected to the experiences of practice, the third year involves a full time conduct of an improvement project in practice."	https://center.hj.se/jonkoping-academy/en/education/masters-program.html
The James M. Anderson Center for Health Systems Excellence	For example **Advanced Improvement Methods (AIM)**; "AIM helps build a broader and deeper understanding of quality improvement, biostatistics, and planned experimentation; **Quality Scholars program** for Healthcare leaders	https://www.cincinnatichildrens.org/service/j/anderson-center/education/
Centre for Healthcare Improvement (CHI) at Chalmers	"…number of courses at the Master's level (from 7.5 to 30 credits) for quality managers, healthcare leaders, and physicians in their specialist training. The education principle is	http://www.chalmers.se/en/centres/CHI/organisation/Pages/default.aspx

University of Technology	that of experiential learning – participants have to perform improvement activities in their own organizations as a basis for reflection and learning new concepts and ideas."	

This is just a sample of the many courses being offered, having significant differences but also similarities, with a quite common feature being the inclusion of a practical component, related with real life experiences of improvement projects conducted in the health sector.

3. Improvement Capability

As indicated in the vision depicted in Figure 1, it is not only individuals but complete systems that need transformation. In the general management discourse this means that the system needs to have capabilities of a special kind – an ability to be continuously self-renewing while at the same time still being effective in serving its customers. This means that it has to be at the same time both efficient and able to explore new possibilities based on external evidence as well as on internal improvement possibilities. Such an organization is sometimes called (contextual) ambidextrous (O´Reilly & Tushman, 2013). The ability to improve/innovate is called improvement capability or, somewhat more general, dynamic capability. The concept has relations to what Senge (1990) popularized as learning organization. Some other early and/or more theoretical papers on related topics are those of Cohen & Levinthal (1990), Bessant et al. (1994, 1997, 2001), Teece & Pisano (1994), and Winter (2003).

In a healthcare context, Adler et al. (2003) discussed what they called Performance Improvement Capability (PIC). They studied a number of healthcare organizations (children hospitals) that were supported by Don Berwick and a team from IHI in a broad improvement initiative. An important starting point for the study group (Adler et al., 2003, p 15) was what the researchers called an:

> *"… optimistic, albeit cautiously optimistic, view. Drawing from our research in hospitals and reviewing the research literature convinces us, first, that large, complex organizations can be redesigned to be more hospitable to innovation and, second, that while people resist change, they often embrace change that they help create. Organization-wide improvement capability can be developed, and the task of theory is to understand when and how it can be developed, …"*

They also noted a number of new challenges for healthcare organizations coming from patients (more demanding) and other stakeholders (cost reduction). Also, the rate of innovations coming from the outside is increasing and the need for internal sensitivity to local hospital specific improvement possibilities must be addressed. The authors identified five components of performance improvement capabilities (Adler et al., 2003):
- *skills:* specifically, technical, business, and social skills
- *systems:* organizational systems and information systems
- *structures:* PI staff groups and PI project structures
- *strategies:* priorities and strategy processes
- *culture:* norms, values, identities

To obtain the required skills for performance improvement, training is a decisive activity. But, also emphasized by other researchers (see above) the interaction of projects and training is

important. In fact, Adler et al. (2003) look upon Performance Improvement Capability as derived from performance Improvement projects and described in Figure 3.
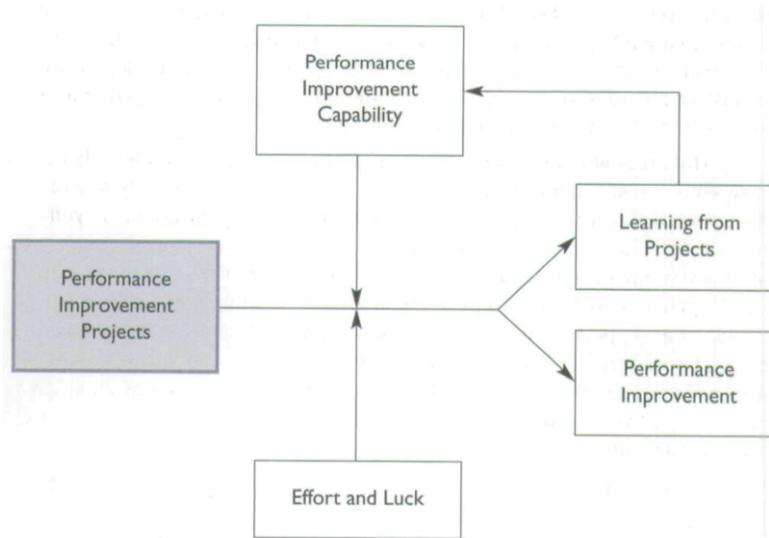

Figure 3. The importance of experiential learning (Adler et al., 2003).

Learning from projects does not only increase skills (individual, team based and organizational) but also creates an understanding for how organizational and information systems and structures should be changed to better support improvement projects. For example, in all but one of the hospitals studied inadequate information systems slowed down or hindered the improvement efforts. Also, projects should not be seen as a number of discrete projects but rather as part of a process supporting and guiding the projects with an emphasis on learning from the projects (see also for example Lifvergren et al., 2010). Adler et al. (2012) also emphasize that the development of new skills, systems, and structures require strategic guidance, i.e. that performance improvement becomes a strategic priority and an active role of top management with a more participatory strategy process[1]. The researchers refer to the leadership model advocated by IHI: *building will*, *generate ideas*, and *executing changes to the system*.

Eventually, all these new features require new behaviours on all levels of the organization and eventually this might change its values and assumptions – a new culture may arise. However, this type of changes do take a long time to accomplish, as indicated in Figure 4. Unfortunately, the place devoted here to Adler et al. (2003) does not give to the authors the credit they deserve – we refer to the full paper for further details. In more recent works on improvement capability, as for example Vackerberg et al. (2016), Agwunobi & Osborne (2016) and Furnival et al. (2017), slightly different theoretical background theories are utilized, but with strong similarities with the previous results and conclusions obtained.

Agwwunobi & Osborne (2016) build on the works of Teece (see e.g. Teece et al., 1997) and his concept of "dynamic capabilities" and apply/introduce his ideas to the healthcare industry. Many of the aspects become quite similar to those of Adler et al. (2003), even if the starting points are somewhat different. In the review by Furnival et al. (2017) the authors try to find a conceptualisation of improvement capability and also how to assess improvement

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[1] Note that in a different context this could be called Policy Deployment (Hoshin Kanri).

capability. Based on a systematic literature search they found 70 studies including 14 literature reviews that fulfilled their criteria for assessment instruments for improvement capability and related concepts. They found different general "models" that include some kind of improvement capability concept: *improvement models*, *governance models*, and *change models*. From these models they could identify eight different "capability dimensions", as follows: *Organization culture, data and performance, employee commitment, Leadership commitment, service-user focus, process improvement and learning, stakeholder and supplier focus, strategy and governance*. For a full description of these models and "dimensions" we refer to the original paper.
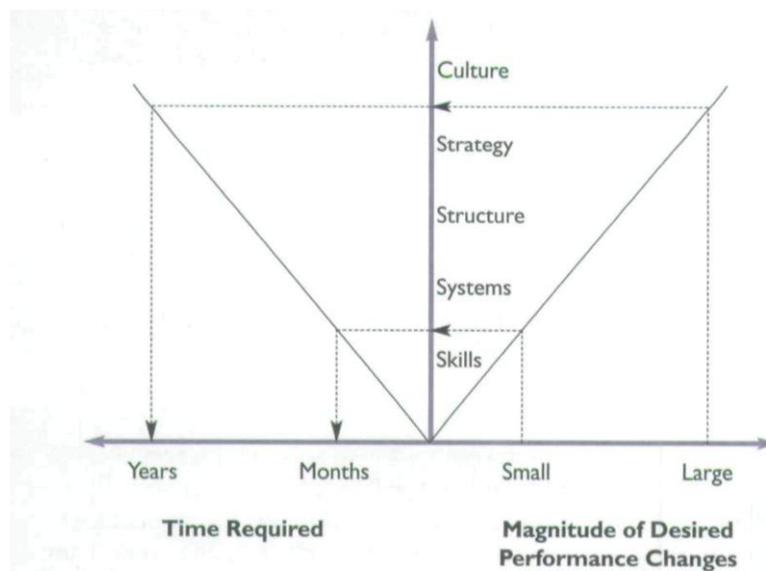

Figure 4.   Radical changes take time (Adler et al., 2003).

In conclusion, there is the need for a better conceptualization of improvement capability applied to healthcare and there is also the need for better an increased understanding about how to achieve increased organizational improvement capability. It is also important to be able to assess to which extent different interventions really have made an improvement in organizational improvement capability.

Thus, in our context the burning question is the following: how education and training initiatives affect the improvement and innovation capability in healthcare organisations?

As earlier emphasised, we will in this paper delimit our search for an answer to academically led training and education initiatives. However, such initiatives will probably not work alone – they have to work in synergy with other factors as indicated for example in Figure 2.

4.   Illustrations and Examples

In this section we will describe some education/training initiatives that have resulted in improved organizational improvement capability, taking into account the conceptual definitions and discussion made in the previous sections of this paper.

4.1 The IHI approach

The Institute for Health Improvement (IHI) is a well-known organization, located in the US but with ongoing initiatives across the world. The following excerpts are taken from IHI homepage on "improvement capability":

"Improvement Capability – *Ensuring that improvement science drives our work and that we extend the reach and impact of the improvement community*

- Building science-based improvement capability at individual, organizational, and system levels;
- Arming future doctors and nurses and others preparing for careers in health care with quality improvement knowledge and skills before they enter the workforce;
- Expanding the capability of middle managers and other operational leaders to use advanced improvement methods to guide and support front-line improvement;
- Developing learning networks to accelerate implementation, spread, and scale-up of innovative approaches to improving health outcomes;
- Providing a clear roadmap for how organizations using Lean and Six Sigma can use the science of improvement to accelerate results;
- Providing individuals, professional groups, organizations, and whole systems with the right "dose" of improvement capability to drive results."

A number of courses directed towards individual improvement capability are provided via the IHI Open School and other courses. For the support of organizational Improvement Capability there is also an "Improvement Advisor Professional Development Program" with the following description:

"The Improvement Advisor (IA) program prepares you to become a highly effective leader in helping your organization or system implement strategically vital improvement initiatives.

- **Level:** Proficient to Expert
- **Format:** Eleven-month experiential program with a preparatory webinar, three 4-day workshops, and 10 monthly webinars in between. Previous experience leading improvement efforts required. Requires an improvement project that is strategically important to the sponsoring organization.
- **Who should attend**: Specialists in improvement and future improvement leaders; individuals/professionals who have or expect to have a major portion of their work focused on improvement."

In addition, at the IHI homepage there are several case studies and reports that could serve as inspiration (see for example Swensen et al., 2013 or Institute for Healthcare Improvement, 2016).

4.2 Dartmouth Institute – Microsystem and coaching courses

Another organization with relevant activities in this field is The Dartmouth Institute, namely through their Microsystem Academy programs (http://clinicalmicrosystem.org/programs), aimed at providing "distinctive action learning and custom programs in the art and science of health care quality improvement and team coaching". One of the key elements considered

corresponds to Improvement Capability, seen as being "the basic building block of any health care delivery system", with the microsystem as "the unit where policy is put into practice, good value, and safe care are produced, and workplace motivators exist". Therefore, in the end, "the overall care provided by the entire organization can be no better that the sum of its frontline microsystems". Keeping this in mind, "The Dartmouth Institute Microsystem Academy is to engage with interdisciplinary health care professionals, organizations, and health systems to share knowledge, methodologies, and tools to support the continual improvement of care at all levels".

Working with this type of approach since the 1980s, the Darthmouth Institute Microsystem Academy was the original developer of the clinical microsystem approach, and since then has acquired a variety of experiences in working with healthcare organizations, and today does offer a number of different programs that do share this common language and paradigm for quality improvement in the health sector through training, coaching and people interaction.

4.3   Courses provided by the Centre for Healthcare Improvement (CHI)

In order to further explain the above ideas, we will now give a short illustration of a collection of continuing education/training courses initiated in 2004 at the Centre for Healthcare Improvement, in co-operation with the Västra Götaland Region (VGR) in Sweden. The first of such courses, now in its seventh edition, is a quarter time education over two years of didactic elements interspersed with interactions amongst the participants' organizations, including a major improvement project in the participants' respective organization that needs to be carried out. The overarching educational idea is illustrated below (Figure 5), closely related to experiential learning, according to Kolb (1985). See also Bergman et al. (2015) for an overall description of the general direction of the contents of this course, based upon principles that are also applied in many other similar initiatives.
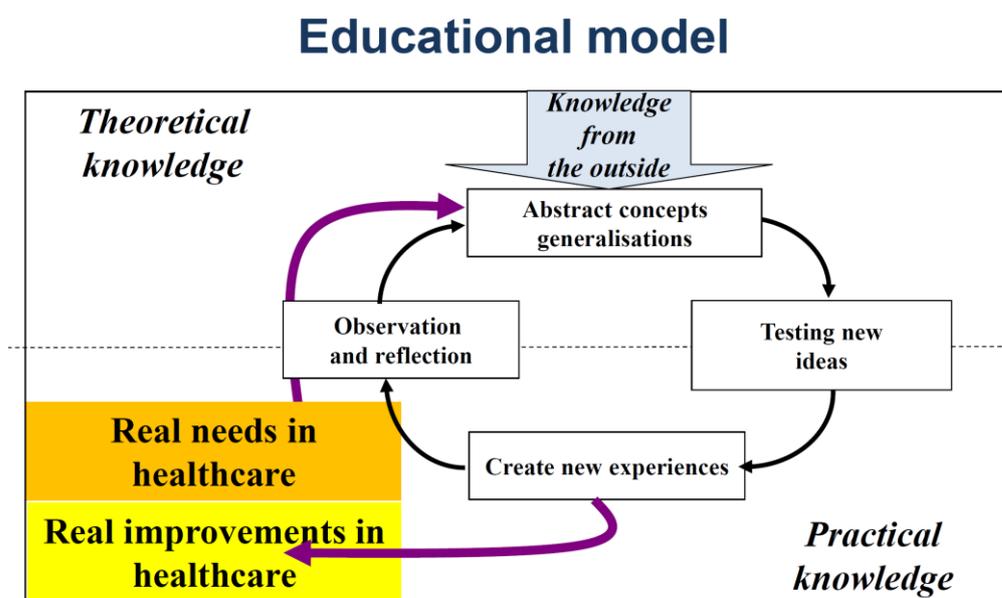

Figure 5.   The experiential learning model as a basic educational idea – strongly related to Kolb (1985).

The initial course was asked for by a quality Director at the Sahlgrenska University hospital in Gothenburg, Marianne Olsson, in order for people involved in quality improvement and organization development to develop a common language and a common view over improvement activities. Since the very beginning it was clear to us that customers of the course were not only the participants, but also their respective organizations. This course was open to other organizations in the area, such as the Skaraborg Hospital Group (SkaS), with a particular Medical Doctor really interested in the quality field. This resulted then in a cascade of further improvement initiatives, with for example six sigma courses that provided many results, leading to improved care and reduced costs (Lifvergren et al. 2010), courses for residents, involvement in PhD education, successful experience of co-design (Gustafsson,2014), among others.

The appreciated results from these courses did also put pressure on the VGR leaders, and there was a request for such courses – a one semester course, quarter time for leaders, was created with essentially the same structure as the longer one. In a number of cases a participant in the longer course triggered their superiors to follow the course for leaders. These then, on their own hand, together with peers and sometimes the support from CHI, created further in-house courses for their own middle managers and process managers with due improvement projects. Examples of such a cascading effect are the Health and Habitation Organization and the Regional Cancer Centre. At the Regional Cancer Centre, process managers (lead doctors in the different cancer diagnoses) were trained with a strong emphasis around process improvements led by process managers, as well as training for contact nurses with a lot of different improvement projects leading to better care for cancer patients.

At CHI there are also further ongoing investigations about to which extent the education/training has resulted in organizational improvement capability. A thicker description of the above short story is one such indication, as provided for example by Lifvergren et al. (2010).

4.4 Institute for Business and Industrial Statistics (IBIS) from the University of Amsterdam

Another entity that has been quite active in the field is IBIS, under the leadership of Ronald Does (Lameijer et al., 2018). Created back in 1996, IBIS has been involved in training and implementation of many operational excellence projects for public sector organizations, with quite impressive efficiency and effectiveness improvements. One of such initiatives corresponds to training and implementation of Lean Six Sigma (LSS) projects. Under the time period of 2003-2015 IBIS was involved in the practical implementation of 52 such projects in services, including healthcare, resulting in benefits on the order of 4 million euros (Lameijer et al., 2018). As an example, at the Red Cross Hospital in Beverwijk over 40 Six Sigma projects were carried out between 2002 and 2005, resulting in estimated annual savings of 3 million euros (Heuvel et al, 2005), after appropriate green belt training was provided to 63 different staff members of the hospital. The categories of improvement projects, carried out by such green belts, are the following:

1) Shortening the length of stay of patients
2) Minimising the use of materials and devices
3) Optimising the use of available capacities
4) Reducing the amount of staff
5) Improving cash flow

With a large portfolio of training offers and accumulated experience in Lean Six Sigma, IBIS does also provide another example (https://ibisuva.nl/english/lean-six-sigma-programmes.html) of working together since 2007 with an academic hospital, resulting until 2013 on the completion of over 230 improvement projects which resulted to healthcare quality improvement and savings on the order of 30 million euros.

5   Conclusions and the need for future initiatives and research

Given the conceptual frameworks introduced in the first Sections of this article, together with some illustrative examples (many others could be also given, such as for instance the Jonkoping Academy for Health and Welfare and their Master's program, mentioned in Section 3), , it is now time to come up with some final thoughts and conclusions.

From the above discussions and illustrations it seems to be clear that:

1. Today's healthcare organizations are in urgent need for improvement activities on many different levels of the organization – especially they need to improve their ability to renew themselves, by combining and integrating improvement, innovation, and dynamic capability.
2. That being the case, one must then question how that can be accomplished in the best possible ways for each specific context, and go after the corresponding answers. Training to increase individuals' skills is necessary but it is not good enough. There is also a well-recognized need to train leaders on all levels of the healthcare organization
3. Further deciding on how we organize such initiatives and create knowledge and insight transformations becomes then a major issue. Fortunately several examples are available to show that through appropriate models, training efforts, and organizational settings it is indeed possible to achieve quite significant improvements of quality in hospitals and other health related organizations, projects, and processes.

Both quality in education and in health are two major areas that need to be considered with special attention and priority, given the societal challenges ahead of us, as shown for instance by the United Nations 2030 Sustainable Development Agenda and Goals. This paper makes a bridge between the two fields, showing both from a conceptual point of view as well as practical illustrations how continuing education in quality improvement for healthcare professionals is critical for achieving organizational improvement capability, and then translate such a capability in quite powerful improvements, transformations, and results. The efforts here reported point clearly for the potential and need for further research and knowledge sharing at the crossroads of quality in education and health, a space where we expect in the future to get additional contributions coming from the Quality in Education Think Tank (QiETT) of the International Academy for Quality (IAQ), namely also in partnership and close collaborations with the European Society for Quality in Healthcare (ESQH), as was also the case for putting together this paper.

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