TAMAM Project

TECHNICAL REPORTS

The Impact of Collaborative Action Research on Inquiry Skills, Habits of Mind, and Orientations toward Collaborative Action Research and Collaboration: The Case of a School-Based Project in an Arab Context

By

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Report # 1

July 2011

This report is published by the TAMAM Project. The research performed and the reported findings in this report were done pursuant to a grant from the Arab Thought Foundation (ATF). However, the opinions expressed herein do not necessarily reflect the position or policy of ATF, and no official endorsement by ATF should be inferred.

The Impact of Collaborative Action Research on Inquiry Skills, Habits of Mind, and Orientations toward Collaborative Action Research and Collaboration: The Case of a School-Based Project in an Arab Context

There is widespread agreement that educational systems in Arab countries need to be improved. The UNDP's 2002 Arab Human Development Report argues that quality of education in the Arab region has deteriorated, implying a decline in knowledge acquisition and analytical and creative skills. The World Bank (2007) echoes the conclusions of the UNDP report by suggesting that the quality of education in the Arab region is falling behind other regions and needs urgent reform if it is to prepare students for the twenty first century work environment. Farouk El-Baz (2007), a prominent Arab scientist and a veteran of the Apollo space program asserts that educational reform is needed urgently in Arab countries because educational systems in these countries continue to emphasize rote learning at a time when succeeding in modern societies requires independent, innovative, and critical thinking.

A careful survey of the terrain of educational reform in Arab countries over the past few decades shows that most of these countries have attempted to reform education. However, invariably, reform has been conceptualized, initiated, funded, managed, and evaluated at the highest level of the ministries of education or other governmental institutions such as centers for educational research and development. Furthermore, those intimately affected by the reform such as teachers, principals, students, and parents have not had any active role in conceptualizing, reviewing, or providing feedback on the reform plans. This approach to reform continues to be the case even though notions of decentralization, private sector involvement in education, school-based reform, local community responsibility for education … teachers' rights and duties have become the norm rather than the exception (El-Amine, 2005) in many developed countries with efficient and productive educational systems (e.g. Finland). Centralized approaches are also continuing despite research evidence which suggests that bottom-up approaches are more effective than top-down ones in strengthening

community participation in decision making (Cameron, Moses, Gillies, & Herstein, 2006) and that involving all stakeholders is necessary for the success of educational reform (Maroun, Samman, Moujaes, & Abouchakra, 2006).

In addition to the problem of centralized reform, there is the problem of scarcity of research on educational reform in Arab countries. Even though, research conferences and seminars on the topic continue to be organized in many Arab countries, these meetings have not resulted in a professional body of research on educational reform that can inform decision makers about the best ways to initiate and implement reform in this region. In fact, organizers of these conferences do not explicitly provide support - or at least encourage - researchers in Arab states to conduct policy research that investigates local educational problem.

It is in the above context that the project entitled "School Based Reform in Arab Countries" was initiated at a university in Beirut, Lebanon. The project is now known as the TAMAM project, an acronym derived from the Arabic title of the project which consists of the initials of "school-based reform" in Arabic (al-tatweer al-mustanid ila al-madrasa) and which means "perfect" in colloquial Arabic. The Project aims to develop a school-based grounded theory of educational reform in the Arab region that will provide policymakers with research-based recommendations for implementing educational reform in their countries. Furthermore, it aims to train men and women to plan and implement activities relevant to educational reform using training materials based on research results generated in the Arab states and to encourage a culture of research-based policy decisions.

The project is structured to promote a "top down support for bottom up change". Consequently, it is analyzing "stories" of successful reform initiatives at the school level to identify the human and material factors and practices that make these initiatives successful. The results of this analysis will then be communicated to policymakers who will be encouraged to use the results. In addition, results will be disseminated by producing training

materials that can be used throughout the region. More importantly, the ultimate aim of the Project is to construct a "homegrown" theory of educational reform that might be more meaningful and useful to educational authorities in Arab states because the data used to develop it come from local schools and its formulation is done by local researchers who have intimate knowledge and insights about the Arab region. This approach is necessary for two reasons. First, most educational reform in Arab states has been large scale and top-down and has not resulted in significant improvement. Second, many ideas for educational reform in Arab states have been "borrowed" from research and development activities conducted in Western countries whose cultural contexts are very different from those of Arab states. Below we present the organizational structure of the TAMAM project along with the role of participants in the project and the processes used in implementing the project.

Organizational Structure of TAMAM

TAMAM was initiated in 2007 and is presently being implemented in three Arab states: Jordan, Lebanon, and Saudi Arabia. It is coordinated by a research team composed of three researchers and three research assistants at a University in Beirut, Lebanon. Three private schools from each country were selected to participate in the Project. Presently, there are three country teams each of which is comprised of a country coordinator, typically from a local university, a Ministry of Education representative, and three school teams, each of which is includes three or four school teachers and/or administrators. In 2009, three Lebanese public schools were selected for participation in the project. However, because their progress is not coordinated with the other schools, a special program based on the training that has been implemented by the first nine schools has been planned for them.

The rationale for including teachers, administrators, university faculty, and ministry of education representatives in each team is premised on the assumption that inclusion of stakeholders at different authority levels and from different professional backgrounds has the

potential to increase professional communications across authority levels and professions and thus enhance the meaningfulness of acquired knowledge. Specifically, the structure allows school team members to conduct research at the school level in collaboration with teachers and administrators from the same school. In addition, these teams have the opportunity to interact with teams from schools and university faculty from the same country, and teams and university faculty from the other three countries that participate in the project. In terms of project structure, each country has a country coordinator who works with the country teams and conducts research at the level of the country. The Ministry of Education representative in each country is a liaison between the project and the ministry who facilitates communication between the project and the Ministry and keeps the Ministry informed about project activities. The local university representative in each country facilitates communication between the Project and the university and ultimately communicates project findings to his/her university. Finally, the university team in Lebanon coordinates the project activities, supports country teams in terms of training and providing feedback, and conducts research on project activities.

Implementation of the Project

The first step in implementing the project was securing funding and country selection. The funds to implement the project came from a non-profit Arab foundation that is dedicated to and interested and involved in educational reform in Arab states. One important characteristic of the funder of this project is the flexibility it provided the implementers to change course and adapt to events in the field. Unlike funders that require the adherence to detailed implementation plans, the funder provided the Project team with enough space to change course when needed and professionally justified. This flexibility was necessary because the Project was built on the assumption that schools and educational systems are

complex, dynamic, and "living" entities that are continuously developing in response to its internal and external environment.

The three countries participating in the study were selected because they differed in important ways: in terms of the size of the country, the type of educational system, the language of science and math instruction, and the reputation of the educational system. These differences were deemed important for the type of research that was planned in this Project. In addition, access to schools in these countries was relatively easy because the University, which was implementing the project had worked in all three countries and established a network of individuals and institutions that would help facilitate the Project activities.

The second step was selecting schools in each country. The schools selected for participating in the project were private, non-profit institutions because of the flexibility of dealing with such schools as compared to working with public school systems that are typically bureaucratic and not open for collaboration with outside researchers. In addition, the schools had to be viewed as innovating schools for at least three years, involved in continuing improvement efforts with at least one project going on at the time of the study, focused on improving student learning, and regarded as effective by members of the community. In addition, the school had to be following the national curriculum, although not exclusively, have a majority of Arab personnel, and ready to facilitate research and development activities for school team members as well as other individuals involved in the Project. Faculty members from the university that was implementing the project and faculty members from universities in Jordan and Saudi Arabia visited the schools and interviewed staff members before the schools were selected to participate in the project.

Following the second step, teams were invited to attend workshops, during the first one of which each school presented an innovative project that the school team or the school was implementing. The purpose of the presentations was to provide all participating schools

the opportunity to see each other's projects and to encourage teams to start thinking about reasons for deciding to select a given project and types of evidence needed to evaluate project outcomes. Following this presentation, participants were introduced to action research as a vehicle to study individual and team practices because this type of research focused on practical issues, allowed educators to research their own practices, and could be conducted by individuals and/or teams. Moreover, the process of conducting action research is dynamic and cyclical in nature thus allowing practitioners to change course and adapt to the complex and dynamic nature of their practice. Finally, action research is participatory by nature, thus allowing all relevant stakeholders to actively examine together problematic actions in order to change and improve it.

Following the first workshop, each school team started researching its own project with support from the University implementing the project with the aim of producing an action research report on their selected project. The support took the form of workshops, meetings with individual schools in the same country, and meetings with all schools in the same country. The first activity that teams completed following the first workshop was coming up with research questions and plans for data collection. Consequently, the second workshop that all participants took was focused on collecting and interpreting data followed by a third workshop on different approaches to data analysis and reporting research. During a fourth workshop, schools presented their initial reports that were discussed thoroughly by other team members as well as by the implementing University team. During the fourth workshop, however, participants were introduced to reflective practice at the individual, team, and school levels for them to start thinking about action research as a vehicle for change at the school level and to involve them more intimately in the cyclical process of action research. To highlight the importance of reflection on practice, the fifth workshop involved participants in a process of evaluative reflection during which each team shared

their reflections on their own work in an attempt to get feedback from others and make what is typically private in schools open to public scrutiny by others. Finally, to reinforce the idea that action research was a vehicle for change, participants were introduced to process of planning for action to improve the school as a whole.

In addition to support in the form of workshops, school teams received support in their own countries through meetings with all teams in the same country to discuss issues that these schools were facing and individual meetings with schools in the same country. Country meetings took place at least once per term for each school and for country teams. In addition, school team members had access to a website that included workshop materials and an electronic forum for discussing issues related to the project. Furthermore, team members had access through email and telephone to all Project team members at the university that is implementing the Project.

It is worth noting that the researchers and research assistants at the University implementing the project collected data on the initiation of the Project and on change in individual team members and teams thinking about their role in the project through interviews, focus groups, and analysis of workshop videotapes meeting minutes and records. As indicated above team members were trained on conducting action research and encouraged to use it to study a project that they were implementing or planning to implement. However, what does the educational professional literature say about the purposes of action research and which type of action research, if any, is conducive to engendering school reform?

Purposes of Action Research

Action research is broadly defined as a process of systematic inquiry which involves practitioners (teachers and other stakeholders) in studying and reflecting on their own practices in order to produce positive change (Gall, Gall & Borg, 2005; Cano, 2004; Gillies, 2009; Mitchell, Reilly & Logue; 2008; Savoie-Zajc & Descamps-Bednarz, 2007). According to Capobianco and Feldman (2010), action research started as a vehicle for teachers to "inquire into their practice in order to improve it" (p: 910) which later expanded into enhancing teachers' understanding of this practice and developing habits of mind with the aim of generating knowledge and validating theories through rather than independent from practice (Eliott 1991, as cited in Capobianco & Feldman, 2010).

The essence of action research is that practitioners-researchers choose issues to investigate which pertain to their everyday teaching and learning, are within their sphere of influence, and about which they care deeply. Moreover, practitioners-researchers are involved in every step of the research (Sagor, 1997). In summary, the main objective of conducting action research is helping practitioners to identify problems in their daily work and to seek systematic solutions to these problems. These problems can come from all educational levels and in all areas of education. According to Somekh and Zeichner (2009), regardless of the "form or variation of action research, a common feature is the importance it demonstrates of working towards a resolution of the impetus for action with the reflective process of inquiry and knowledge generation, to generate new practices" (p. 18). Hence, the essence lies in recognizing that action research brings about change, improvement in education, as well as transformation in the ways teachers view their practice. For example, the action research projects in Cullen, Akerson and Hanson's (2010) study had a transformative effect on teachers; they provided them with opportunities to engage in inquiry and transfer that to their students with the purpose of teaching aspects of the nature of science. Similarly, teachers

enrolled in a collaborative action research study by Subramaniam (2010) reported a transformation in their teaching roles. Subramamian (2010) asserted that "[teachers] began to understand that their teaching role consisted of diversified and expanded actions" (p. 948). Action research can be categorized in terms of its purposes. Hence, there is action research for professional development, action research for political purposes and action research for school reform. Studies might have one or more of the above.

Action Research for Professional Development

Action research as a tool for professional development of teachers has been the most prevalent type of action research (e.g. Ax, Ponte & Brouwer, 2008; Mitchell, Reilly & Logue, 2008; Vogrinc & Zuljan, 2009). The main goal of this research is helping teachers become more autonomous, active, and reflective practitioners and researchers (Bustingorry, 2008, Kang, 2007; Li, 2008 ;). A key factor in this approach is involving all stakeholders in individual or group reflection (Mata-Segreda, 2006). Studies show that action research supports the ongoing professional development of practitioners and positions all stakeholders involved as learners rather than experts. Lebak and Tinsley (2010) noted that collaboration and reflection encouraged teachers to inquire into their everyday classroom practices which helped to engage their students in inquiry; a goal included in most standards documents around the world (e.g. National Research Council, 1996). Lebak and Tinsley asserted that peer reflection as well as feedback from students was crucial in transforming teachers' practices.

Moreover, action research helps pre-service and in-service teachers develop their intellectual capacities and their skills in curriculum development, classroom management strategies, teaching strategies and several other teaching-related practices, without leading to teacher burnout (Cano, 2004; Mitchell, Reilly & Logue; 2008). For example, Cullen, Akerson and Hanson (2010) report results from research on a professional development program that

aimed to help teachers conduct action research on teaching the nature of science (NOS). The researchers reported that teachers identified several advantages of action research such as improving their views of themselves as teachers and their self-confidence. Moreover, teachers appreciated the fact that they reflected on their practice, shared their experiences with others, interacted with both administrators and parents, and were engaged in the research process. Additionally, teachers suggested that action research was a useful tool for applying inquiry in classrooms allowing them to work like scientists; a finding that is asserted by Megowan-Romanowicz (2010). In his turn, Li (2008) emphasized the notion that action research provides opportunities for beginning teachers to think and practice like accomplished teachers; an experience which enables them to recognize themselves as learners on the journey of teacher development.

Action Research for Political Purposes

Schools can be viewed as learning organizations in which issues of power, leadership, interpersonal relationships, society and culture, and politics of local authorities play a key role in shaping the structure and dynamics of the educational system (Somekh & Zeichner, 2009). Within this context, the purposes of conducting action research go beyond the individual and the school setting to the educational system as a whole and thus become political in nature. In fact, action research is believed to promote democracy and equity in education, and collaboration among members of the educational community (Gall, Gall & Borg, 2005; Sagor, 1997). Accordingly, action research becomes action for social change, shifting the goal from an individual to a collaborative one, intentionally aiming at organizational development and deep structural change (Brydon-Miller & Maguire, 2009; Tuck, 2009). According to Sagor (1997), the right mix of culture, history, leadership and structural support is needed to bring the full power of action research to realization of results.

Action Research for School Reform

The implicit assumption behind the use of action research as a tool for teacher professional development is that it can contribute indirectly to school improvement. However, although this is a necessary condition for change, it is not sufficient (Sagor, 1997). Teachers may implement change in their classrooms with a minimal impact on the school, and even less on the system in general. Therefore, approaches to action research that promote investigations involving several stakeholders (teachers, administrators…) in the service of school reform are necessary. These approaches are most commonly referred to in the literature as participatory action research (PAR), collaborative action research (CAR), cooperative inquiry, or action learning. The rationale behind such approaches is that people who hold the same goals, beliefs and visions which are constructed from the "ground-up" work more efficiently and harmoniously towards achieving improved performance, and hence action research is viewed as a phenomenon which is strongly mediated by the culture of the school (Clausen, Aquino & Wideman, 2009; Sagor, 1997).

The aim behind the approaches presented above is building learning communities and solidarity for school improvement efforts, as well as contributing to the theory and producing a knowledge base that would be useful to other practitioners and educators (Gall, Gall & Borg, 2005). In fact, by creating a collegial networking system, action research allows researchers and practitioners to share findings with the educational community and other practitioners and researchers. For example, a grade one teacher in Goodnough's (2010) study asserted that she studied her beliefs about science teaching and learning, gained insight into her professional development and changed many facets of her science teaching in addition to having the opportunity to share her experiences with other teachers in her community. Furthermore, participation in collaborative action research activities gives voice to teachers in school matters, fosters a democratic approach to decision making, empowers teachers, helps

them to develop a sense of identity and belonging, and increases their self-efficacy (Cano, 2004; Mitchell, Reilly & Logue; 2008). Goodnough (2010) asserted that learning through collaboration in action research empowered teachers and rendered them generators of their own knowledge, an aspect that provided them with ownership and held them responsible for this knowledge rather than being dependent on outside sources of knowledge for solving their problems. Reports on studies that aimed at school reform such as the LEARN project (Sagor 1991, 1997) show that action research can engender school reform if conducted cooperatively with the help of knowledgeable and supportive others within and outside the school.

Unlike using action research that aims to reform schools through integrated and coordinated activities at the school level (e.g. LEARN project), action research can be used to tackle specific issues in schools that eventually aim at school reform. For example, Clausen, Aquino and Wideman (2009) used action research to promote a learning community in a small Canadian school, a community that in due course will lead to school improvement. Similarly, Angelides, Georgiou and Kyriakou (2008) implemented a collaborative action research program whose aim was to investigate and enhance inclusive practices at the school level because of the belief that enhancing these practices will ultimately improve the whole school environment.

Gall, Gall and Borg (2005) and Sagor (1997) have identified several conditions that are necessary for action research to be a positive force for educational reform. These conditions include the following: 1) Practitioners and researchers must have consensus regarding the research focus and must share common cultural perceptions, 2) carrying out a successful action research project requires adequate time, 3) participants in action research must feel that change is within their collective power while recognizing the leadership as supportive and committed to their vision; 4) researchers must cooperate to achieve the

intended outcomes, and 5) researchers must be willing to share their findings with other stakeholders and people in the education communities.

There are many similarities between the TAMAM project and the projects in the studies described above, especially the LEARN project. However, it is different from these studies in several ways. First, most reviewed studies aimed to help the individual teacher develop her or his practice through reflection in professional development contexts. Other studies had political agendas. The rest are similar to the TAMAM project in that their aim is school reform. TAMAM, however, has the added purpose of developing a homegrown grounded theory of school reform relevant to the Arab states; thus making it a research and development project. Second, in several studies reviewed by Somekh and Zeichner (2009), universities were involved in partnerships with schools and governments to use action research as a strategy for educational reform. However, this involvement was through courses designed for pre-service teachers, for ongoing professional development courses, or through the work of graduate students conducting action research as restricted to providing the necessary trainings. Follow-up work with teachers becomes the responsibility "critical friends", educators with research experience who volunteer to help teachers by giving their independent viewpoints. Thus, the work of the "Critical friends" is to support rather than manage the project. In this study, involvement of the university that is implementing the TAMAM project is more-hands-on and continuous and can best be described by using Somekh and Zeichner's words (2009): "universities have status within the system but not the power to lead its reform. They intervene, sometimes very powerfully, from the sidelines". Third, funding needed to implement the TAMAM project came from a non-profit Arab foundation involved in educational research that allowed TAMAM implementers to alter the course of the project as needed because of the dynamic and cyclical nature of action research. This flexibility is not common in funded research and development projects in which funders

typically require very detailed action plans. Fourth, TAMAM project participants include educators from three Arab states that share centralized educational systems, cultural norms and customs, and religious affiliation on one hand but have many contextual differences on the other. Moreover, schools involved in this phase of the study were private schools and as such had less bureaucratic constraints than government schools.

Research in the TAMAM Project

The focal research question in TAMAM Project was designed to answer the following question: How do change agents, processes, and contextual factors interact in an Arab school to enable or handicap sustainable innovation to increase students' abilities and improve attitudes for lifelong learning? The elements of the TAMAM focal research question are represented in the schematic drawing in Figure 1.

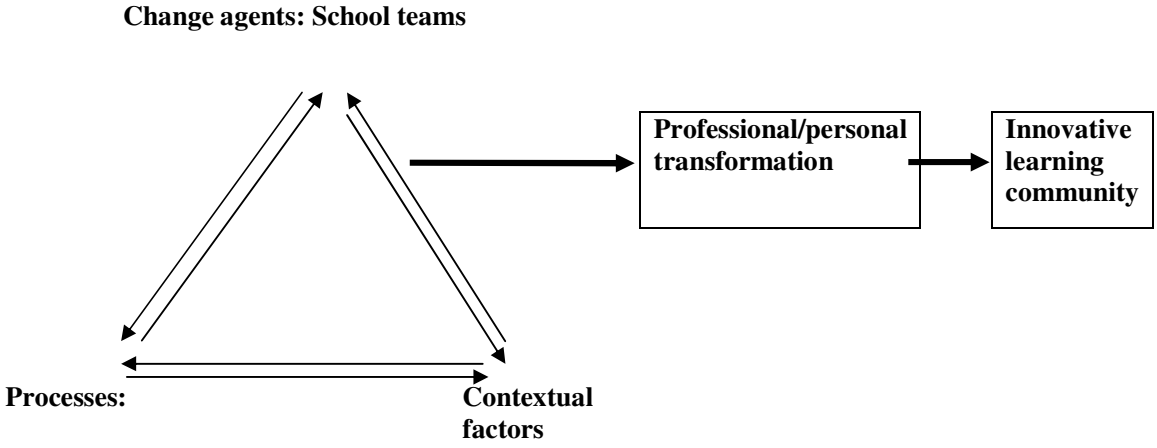

Figure1. The elements of the focal research in TAMAM Project

Because TAMAM is different from the projects investigated in the reviewed literature, it is important to investigate its impact in the schools where it is being implemented. Consequently, the purpose of this study is to investigate the impact of engagement of school teams in collaborative action research (processes) on their personal transformation with regard to inquiry skills, habits of mind and attitudes toward action research and school collaboration as a step towards becoming change agents (TAMAM school teams) in their

respective schools (Context) to achieve an innovative learning community. Specifically, the study addresses the following two questions:

1. What is the impact of the school teams' collaborative action research experience on:
    a. targeted elements of inquiry skills and habits of mind
    b. orientations toward collaborative action research
    c. attitude toward collaboration in school teams
2. How is this impact mediated by the school and project contextual factors?

As indicated above, schools are complex and dynamic systems thus making it hard to study the impact of projects being implemented in these schools by using simple research tools. It is imperative to study these schools as systems with many interacting elements by using tools that are sensitive to the complexity and dynamism inherent in these schools. Consequently, we chose to study the impact of action research taking place in the TAMAM schools by using the activity system described below.

The Activity System

Activity theory was developed by Leont'ev (1981). He defined activity as "the unit of life that is mediated by mental reflection. The real function of this unit is to orient the subjects in the world of objects. In other words, activity is not a reaction or aggregate of reactions, but a system with its own structure, its own internal transformations, and its own development. (p.46)" A central assertion of activity theory is that our knowledge of the world is mediated by our interaction with it, and thus, human behavior and thinking occur within meaningful contexts as people conduct purposeful goal-directed activities. This theory strongly advocates socially organized human activity as the major unit of analysis in psychological studies rather than mind or behavior.

Engeström (1987) developed the construct of activity system to describe and account for the collective (as compared to individual) human activity in the broad historical-cultural-social contexts. Engeström (1999) identified the following elements of the activity system:

1. The *object* is the problem space targeted by the activity of the organization and this goal-object is transformed into outcomes.
2. The *subject* refers to an individual (individual activity) or a group (collective activity) in an organization.
3. The *mediating artifacts* are cultural products that act as intermediary or auxiliary in effecting the appropriation of the cultural aspects embodied in these products. The mediating artifacts consist of physical and symbolic, external and internal mediating instruments, including both tools and signs.
4. The *community* represents those individuals and or subgroups that share the same general object of the activity and define themselves as distinct from other communities.
5. The *rules* are the explicit and implicit regulations, norms, and conventions that regulate and control the actions and the interactions within the activity.
6. The *division of labor* refers to both the division of tasks between members of the community and to the division of power and authority within the activity.

The school may be considered an activity system whose basic activity has the "object" of student learning that result in desirable learning outcomes. The elements of the school as an activity system are shown in Figure 2.

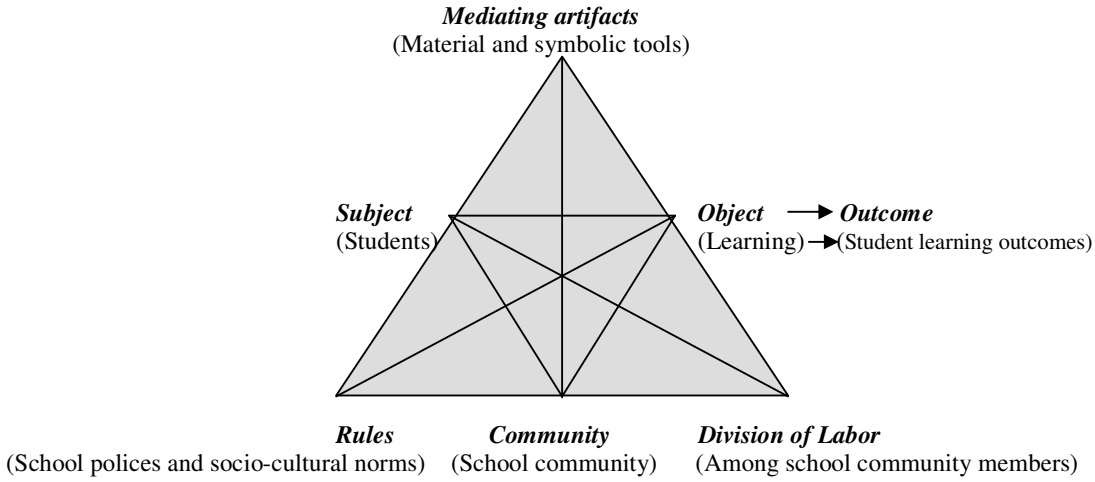

Figure 2. The school as an activity system

This paper addresses a particular aspect of the school as an activity system namely the activity that has as the same object i.e. student learning, but with a wider spectrum of outcomes represented by rendering the school as a learning community. The "subject" in this activity system is the school team and the main artifact is action research. Figure 3 is a schematic representation of the school activity system as adapted to TAMAM project.

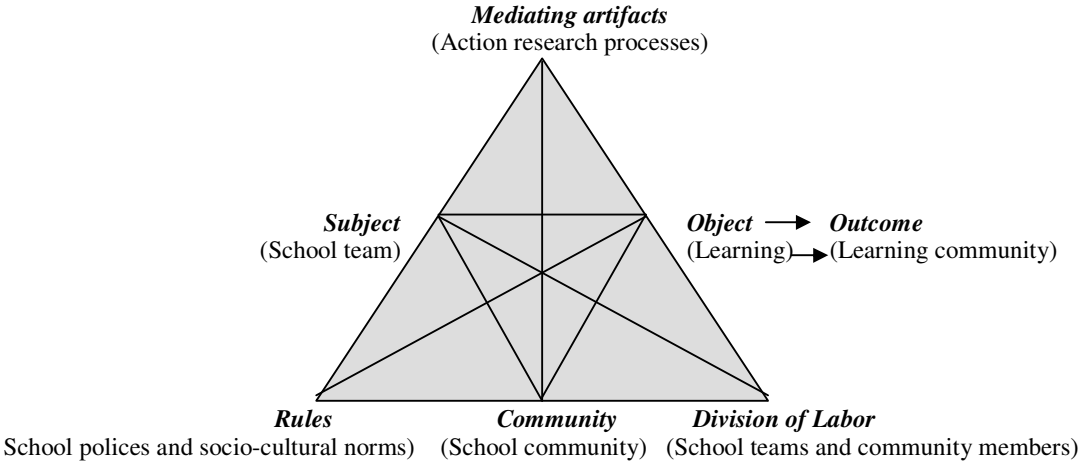

Figure 3. The school activity system as adapted to TAMAM project

Transformation

Engestrom (1999) introduced the model *expansive cycle* in work teams. The expansive cycle is a qualitative transformation of the activity system as a whole. The expansive cycle starts from some dialectical tension between the different nodes in the activity system. The change starts at the level of the individual members of the community, through the processes of internalization and exteriorization. The successful orchestration of the collective emerging individual activities will be an expansive cycle that eventually transforms the system into one that is free of the tension that started it. The transformed system has now different relations and interactions among its components.

This paper targets a school transformation toward becoming a learning community by using action research as a main artifact to effect this transformation. The Activity system and the expansive cycle constructs will be used as a theoretical framework to analyze and interpret the extent to which the participating schools achieved the goal of being transformed to learning communities.

Methodology

Participants

The participants consisted of all members of school teams (current and past members), the MOE representatives as well as the university representatives in the three schools in each of the three countries (Lebanon, Jordan, and Saudi Arabia). Twenty five participants (10 from Lebanon, 7 from Jordan and 8 from Saudi Arabia) of a total of a pool of 33 participants participated in the study.

Data Sources

Data for this study came from a questionnaire entitled “The Collaborative Action Research Questionnaire (CARQ)” in addition to interviews with school teams conducted toward the end of the first phase of the project.

The Collaborative Action Research Questionnaire (CARQ)

The CARQ was constructed to measure the impact of the collaborative action research experience in TAMAM, from the perspective of the participants, on their habits of mind, inquiry skills, orientations toward collaborative action research, and attitudes toward collaborative action research. The content validity of the items in CARQ was checked by four individuals who were intimately familiar with TAMAM but not part of the sample of this study. The questionnaire consisted of four subscales and an open-ended question: Collaborative action research as habits of mind, collaborative action research as an inquiry, orientation toward collaborative action research, and Attitude toward school team collaboration. In addition, CARQ included an open-ended question which asked participants about the most important lessons learned from their action research experience in TAMAM. The CARQ was put on line and made accessible to all participants in TAMAM. Twenty five participants (10 from Lebanon, 7 from Jordan and 8 from Saudi Arabia) of a total of a pool of 33 participants responded to the questionnaire.

Collaborative action research as habits of mind subscale. This subscale was constructed to measure the extent to which the collaborative action research experience in TAMAM impacted the application of professional practices that reflect the habits of mind that were targeted implicitly or explicitly in TAMAM. The subscale was a 4-point scale with 1 indicating 'not at all' and 4 indicating 'to a great extent'. This subscale has 12 items (see Appendix 1). *Cronbach* α was used to find the internal consistency of the subscale and was found to be 0.91.

Collaborative action research as an inquiry subscale. This subscale was constructed to measure the extent to which the collaborative action research experience in TAMAM impacted the application of professional practices that reflect the inquiry skills that were targeted implicitly or explicitly in TAMAM. The subscale was a 4-point scale with 1

indicating ‘not at all’ and 4 indicating ‘to a great extent’. This subscale has 19 items (see Appendix 1). *Cronbach* α was used to find the internal consistency of the subscale and was found to be 0.90.

Orientation toward collaborative action research subscale. This subscale was constructed to measure the extent to which the collaborative action research experience in TAMAM impacted the participants’ orientation toward collaborative action research, that were implicitly or explicitly targeted in TAMAM. The subscale was a Lickert 5-point scale with 1 indicating ‘strongly disagree’ and 5 indicating ‘strongly agree’ for positive items. For negative items these were reversed. This subscale has 20 items (see Appendix 1). *Cronbach* α was used to find the internal consistency of the subscale and was found to be 0.64.

Attitude toward school team collaboration. This subscale was constructed to measure the extent to which the collaborative action research experience in TAMAM impacted the participants’ attitudes toward school team collaboration, that were implicitly or explicitly targeted in TAMAM. The subscale was a 5-point Lickert scale with 1 indicating ‘strongly disagree’ and 5 indicating ‘strongly agree’ for positive items. The negative items in this scale were reversed. This subscale has 20 items (see Appendix 1). Cronbach α was used to find the internal consistency of the subscale and was found to be 0.68.

Data Analysis

Analysis of data collected by using CARQ (Quantitative part). The 25 responses that we received were coded and entered into an SPSS file. For each of the four subscales, we used the one-sample t-test to compare the responses to pre-determined standards. . Also, we used the MANOVA to compare the three countries on the four subscales and the period spent in TAMAM (12 months versus 36 months).

Analysis of data from interviews and the open-ended questionnaire in CARQ. Interview data as well as the open-ended question in the Collaborative Action Research

Questionnaire (CARQ) were analyzed qualitatively. The categories and subcategories of the CARQ were used as the data analysis framework for qualitative data. In addition, one category, organizational change, emerged from the data analysis (see appendix I). The five categories of the framework were: Collaborative action research as an inquiry, Habits of mind, Orientation toward Collaborative Action Research, Attitudes toward School Team Collaboration, and Organizational Change. In this analysis, each interview from each school was analyzed separately in search for the categories and subcategories in the framework. Consequently, frequencies and percentages of the categories and subcategories were calculated and tabulated in order to perform comparisons between schools in the same country as well as among countries (see appendix II).

A coding system was used to analyze the qualitative data generated in this study. To refer to the countries, letters were assigned to each; S, J, and L. Moreover, to refer to schools, the letter of the country to which that school belongs was used preceded by a number from 1 to 3. Thus, the codes for the schools are the following: S1, S2, S3, J1, J2, J3, L1, L2, and L3. On the other hand, to refer to the categories and subcategories, the first letter or letters of each a words denoting the category were used preceded by a number denoting the subcategory as it appears in the CARQ. Thus, I was used for the "*Collaborative action research as an inquiry*" category, H was used for the "*habits of mind*" category, OA was used for the "*Orientation toward Collaborative Action Research"* category, and AC was used for the *"Attitudes toward School Team Collaboration"* category. In addition, the letter O was used to denote the "*organizational change*" category.

Assertions were generated for each school individually and then more general assertions were developed about all schools in all three countries with the purpose of generating the actual impact of the TAMAM project on the teachers' skills of inquiry, habits of mind, orientation towards collaborative action research and their attitudes towards

collaboration. Moreover, an additional category which refers to "*organizational change*" was also used in the qualitative analysis. This category refers to the teachers' awareness of the fact that change in the individual might have impacted change at the level of the organization to which the person belongs.

Results from the qualitative analysis of the interviews and the open-ended question from the CARQ were used to support the results obtained from the quantitative analysis of the items of the CARQ to provide more validity for the assertions.

Results

Each subscale mean was statistically compared with an appropriate point scale. The mean scores of 'Collaborative Action research as Habits of Mind' and 'Collaborative Action Research as Inquiry' subscales were compared to the scale point of 3.5 (both subscales were on a 4-point scale where 1 denotes 'Not at All' and 4 denotes 'To a Great Extent'). The mean scores of 'The Orientation toward Collaborative Action Research' and ' Attitudes toward School Team Collaboration' subscale were compared to the scale point of 4 (both subscales were on a 5-point scale where 1 denotes 'Strongly Disagree' and 5 denotes 'Strongly Agree ' for positive items and the values were reversed for negative items). Table 1 presents the means, standard deviations (S), and the significance of the four subscales.

Table 1 shows that the mean of 'Collaborative Action Research as Habits of Mind' subscale was the highest and was close to the highest point of the scale which corresponds to applying these habits of mind 'to a great extent'. Thus the participants reported that, among the four subscales, the greatest impact of their action research experience in TAMAM was on their habits of minds.

Table 1

Means, Standard Deviations and Significance of the Four Subscales

Subscale	Mean	Maximum	S	Decision
Collaborative action research as habits of mind	3.71**	4	.35	Significantly greater than 3.5
Collaborative Action Research as Inquiry	3.31*	4	.38	Significantly less than 3.5
Attitudes Toward School Team Cooperation	4.14	5	.43	Not significantly different from 4
Orientation Toward Collaborative Action Research	3.91	5	.34	Not significantly different from 4

*** P < .01 * P < .05*

Impact on Habits of Mind

In Table 2 we compared statistically the mean items of the 'Collaborative Action Research as Habits of Mind' subscale to a scale point of 3.5 in order to identify the reported impact of the TAMAM action research experience on the specific habits of mind targeted in the subscale. Table 2 shows that the following habits of mind (presented in decreasing order of reported impact) have the highest impact and were close to the highest scale point:

- Listen carefully and critically to arguments
- Remain open to continuous learning
- Recognize what I know and what I do not know
- Be open to the ideas of others when taking decisions
- Be critical of my own practices and those of others
- Be reflective in my own professional practice

Thus the participants reported that their collaborative action research experience has impacted the habits of mind of openness, recognition of self and others, being critical and

reflective of professional practice. However, the participants reported that the other six habits of mind in Table 2 were practiced between 'To some Extent' and 'To a Great Extent'.

Table 2

Means and Standard Deviations of the Items in the 'Collaborative Action Research as Habits of Mind' Subscale

Item	Mean	S
1. Be reflective in my own professional practice*	3.75	.53
2. Be critical of my own practices and those of others**	3.75	.44
3. Value evidence in my professional decisions	3.67	.56
4. Be open to the ideas of others when taking decisions**	3.79	.41
5. Listen carefully and critically to arguments**	3.88	.34
6. Be accountable for what I say and write	3.67	.56
7. Come up with innovative solutions to problems of practice	3.67	.48
8. Take responsible risks	3.58	.58
9. Recognize alternative explanations	3.46	.59
10. Question the opinions of others.	3.58	.58
11. Remain open to continuous learning**	3.88	.45
12. Recognize what I know and what I do not know**	3.88	.34

** Significantly greater than 3.5 (P < .05)*
*** Significantly greater than 3.5 (P < .01)*

The qualitative analysis of the interviews and the open-ended question produced a total of 91 incidents that support the positive impact of the TAMAM experience on the participants' habits of mind. The habit of mind which received the highest percentage of positive instance (39 incidents accounting for 43% of the total incidents of the habits of mind subscale) was being 'reflective in their own professional practice'. This supports the results from quantitative analysis (see item 1 in Table 2). The following are a few excerpts illustrating reflective practice:

> *"I think even if you don't ask for it [reflective practice], we would do it" (S1-3, (Interview [INT].)*

Exactly, the intervention, the procedure… Everybody will propose something and we will discuss, reflect, then choose the optimal one (S3-1, INT.)

Now they know what it means for them to stop and contemplate and reflect, not think there's a difference between the two (S3-3, INT.)

Moreover, teachers valued evidence in taking professional decisions; 22:24% incidents were reported.

However, by using this research method, if I give convincing reasons for changing the curriculum, then the administration will have to do it. If I tell them "I'm giving you this solution which result in the following…if you don't do this, you won't obtain these results". By doing that, we convince them. (L1-3, INT)

No, we have to search for evidence, why did it become like this? What can I do to the problem? How can I measure it? How can I reach a point to see if it is really a problem or not? (S3-2, INT.)

I want something as an evidence to show the teachers that when I give them a strategy, it's not just another piece of paper (J2-6, INT.)

In addition, a third category of the habits of mind subscale was also positively impacted and that is "being critical of ones own professional practice and of those of others", 9:10% incidents were reported.

We're able to do constructive criticism because we have to think together, not because we want to criticize each other, and it makes a whole lot of difference for change (S3-3, INT)

Course criticism is required. And there is always a challenge (L1-4, INT)

Impact on Inquiry Skills

Table 1 shows that the mean of the 'Collaborative Action Research as Inquiry' subscale has a mean of 3.31 (out of a maximum of 4) was significantly greater than 3.5 ($P < .05$). In Table 3 we compared statistically the mean items of the 'Collaborative Action Research as Inquiry' subscale to a scale point of 3.5 in order to identify the reported impact of the TAMAM action research experience on the specific inquiry skills. Table 3 shows that all the inquiry skills have a mean close to 3.5 which is midway between 'To some Extent' and 'To a

Great Extent' the highest scale point, with exception of the following skills which had a mean which significantly lower than 3.5:

- Construct data collection tools that are aligned with the identified research questions
- Derive research questions from research articles
- Use appropriate quantitative and qualitative data analysis methods
- Insure the reliability of qualitative data analysis

Table 3

Means and Standard Deviations of the Items in the Inquiry Subscale

Item	Mean	S
1. Identify problems in my professional practice that can be resolved through research	3.42	.65
2. Define questions that can be answered through research	3.46	.66
3. Identify and analyze several alternative answers to research questions.	3.42	.58
4. Identify data sources that are aligned with the identified research questions	3.33	.70
5. select data collection tools that are aligned with the identified research questions	3.42	.58
6. Construct data collection tools that are aligned with the identified research questions*	3.17	.70
7. Plan appropriate procedures for data collection	3.58	.50
8. Be aware of school contextual factors associated with selecting, constructing, and administering data collection tools	3.67	.49
9. Select appropriate data analysis methods	3.38	.65
10. Design and conduct an inquiry	3.33	.70
11. Derive research questions from research articles**	1.88	.80
12. Use appropriate quantitative and qualitative data analysis methods**	3.04	.69
13. Insure the reliability of qualitative data analysis**	3.00	.78
14. Summarize and organize data to answer the research questions	3.46	.66
15. Develop explanations / interpretations of results based on evidence	3.54	.59
16. Analyze alternative explanations / interpretations of results	3.42	.65
17. Write a research report that communicates the purpose, procedures and interpretations of an inquiry	3.50	.66
18. Present a research report that communicates the purpose, procedures and interpretations of an inquiry	3.52	.59
19. Argue in support of the findings of a research study.	3.46	.588

** Significantly less than 3.5 (P < .05)*

*** Significantly less than 3.5 (P < .01)*

Participants reported that their collaborative action research experience has impacted 14 of the 19 inquiry skills which are practiced between 'To some Extent' and 'To a Great Extent'. However, the participants reported that the other five inquiry skills in Table 3 were practiced between 'A little' and ' To some Extent'

The qualitative analysis shows that the following three inquiry skills received the highest percentage of positive instance from the participants:

- Identifying problems in professional practice (34:33% of the total instances)
- Constructing data collection tools aligned with identified research questions (11.11% of the total instances)
- Designing and conducting an inquiry (13:13% of the total instances

All three inquiry skills were among those that were reported in the questionnaire by the participants to be impacted by the collaborative action research experience. This supports the results from quantitative analysis (see Table 3). The following excerpts illustrate these thee skills as documented from the interviews and open-ended question in the questionnaire:

> *And all this is done based on finding a solution to a problem that the school might be facing. This project is done in a way that allows any type of problem to be solved (L1-1, INT.)*
>
> *Our experience with the felt need in the school failed because we thought that there was a felt need with the remedial, but when we asked people in the school, it turned out that it wasn't a big problem (S2-1, INT.)*
> *TAMAM, like you've said, made me know that I have a problem, made me wonder how I can improve myself (J3, INT.)*
>
> *As a class, as groups, as pairs…as the students are sharing by themselves, I observe them. Then I collect all this for my data collection (J2-5, INT.)*
>
> *We started defining the idea to the rest of the divisions, and then we began to give them the tools which are action research, questionnaires (how to build them), focus groups (how to make them) and all these tools (J3, INT.)*
>
> *I learned a new tool to inquire, investigate a problem or a new project before I start (P13, CARQ-Ques.)*

To plan- act- reflect- re-plan- act- reflect: the inquiry cycle which every human has instinctively but how to apply it systematically and collaboratively (P8, CARQ-Ques.)

The inquiry approach, its design and pedagogical implications which I have learned from TAMAM give me insight of developing a successful way for improving school practices that in turn would enhance students' learning (P14, CARQ-Ques.)

Impact on Attitudes toward School Team Cooperation

Table 4 shows that the mean of the 'Attitudes toward School Team Cooperation' subscale has a mean of 4.14 (out of a maximum of 5) which was not significantly different from 4 (agree) on a 5-point scale ($P < .05$). This means that the participants were positive regarding the impact of their experience in TAMAM collaborative action research on their attitudes toward school team cooperation.

In Table 4 we compared statistically the mean of items of the 'Attitudes toward School Team Cooperation' subscale to a scale point of 4 in order to identify the reported impact of the TAMAM action research experience on the specific attitudes toward school team cooperation. Table 4 shows that the following attitudes (presented in decreasing order of reported impact) have the highest positive impact and were close to the highest scale point (5):

- My experience working in a TAMAM school team has been positive
- My experience working in a TAMAM school team has been positive (negative item)

The participants reported that they have positive attitude toward the remaining ten statements regarding school team collaboration. On the other hand, the participants strongly agreed that their collaborative action research experience has been positive and disagreed strongly with the statement that working in TAMAM was a poor way to learn.

Table 4

Means and Standard Deviations of 'Attitudes toward School Team Collaboration' Subscale

Item	Mean	S
1. My experience working in a TAMAM school team has been positive**	4.76	.52
2. Working in TAMAM was a poor way to learn **	4.56	.71
3. feel comfortable interacting with other members of my team	4.32	1.07
4. In my experience, team members usually do their fair share of work	3.71	1.08
5. I feel uncomfortable interacting with members of other teams	4.00	1.1
6. Teams produce low-quality work	4.32	.90
7. prefer a learning experience that involves working in teams over one that does not	4.20	.96
8. would like to work in a team even if someone else chose the members	4.08	.76
9. feel uncomfortable giving feedback to team members	4.20	.87
10. get concerned that I might embarrass myself when I share my ideas in front of my other team members	4.32	.99
11. I get concerned that I might embarrass myself when I share my ideas in front of members of other teams	4.21	1.02
12. TAMAM school teams there was adequate recognition of the contribution of each team member	3.76	1.13
13. The presence of members of the school administration in a team inhibits openness	3.64	1.29
14. The participation of members of the school administration in the team enhances the effectiveness of the team	3.84	1.18

*** Significantly greater than 4 (P < .01)*

Impact on Orientation toward Collaborative Action Research

Table 1 shows that the mean of the 'Orientation toward Collaborative Action Research' subscale has a mean of 3.91 (out of a maximum of 5) which was not significantly different from 4 (agree) on a 5-point scale (*P < .05)*. This means that the participants were positive regarding the impact of their experience in TAMAM collaborative action research on their orientations toward collaborative action research.

In Table 5 we compared statistically the mean items of the 'Orientation toward Collaborative Action Research' subscale to a scale point of 4 in order to identify the reported impact of the TAMAM action research experience on the specific orientations toward

Table 5

Means, Standard Deviations of the 'Orientation toward Collaborative Action Research' Subscale

Item	Mean	S
1. Collaborative action research helps practitioners to make informed decisions regarding school issues**+	4.68	.476
2. It is practical to conduct collaborative action research in school settings	4.24	.72
3. Academic research leads to more objective scientific results than collaborative action research **-	3.00	1.19
4. The goal of collaborative action research is the same as that of academic research	3.84	.89
5. Collaborative action research is not useful in identifying problems of practice**-	4.58	.50
6. In collaborative action research we should only collect data that lend themselves to statistical analysis only	4.28	.73
7. In collaborative action research we should only collect data that can be analyzed easily	4.00	1.00
8. In collaborative action research we should only collect data that confirm our hypotheses**-	4.48	.59
9. In collaborative action research we should collect data that rule out alternatives hypotheses**-	2.55	1.40
10. In collaborative action research we should only analyze data that confirm our hypothesis	4.29	.91
11. In collaborative action research we should analyze data that rule out alternative**-	2.48	1.27
12. Conclusions drawn from collaborative action research are mainly subjective*-	3.55	1.01
13. Qualitative data help in understanding the reasons behind findings from research	4.12	.88
14. Quantitative data help in establishing relationships and understanding them	4.00	.96
15. Conclusions drawn from collaborative action research apply only to the specific context in which the study was conducted	3.88	1.13
16. The "voice" of the researcher is an important component of the collaborative action research report	4.08	.95
17. In writing a report of an action research, detailed description of the context in which the collaborative action research study was conducted should be avoided	4.00	1.22
18. In writing a report for an action research, description of the actions of the researchers while doing the study should be avoided	4.24	.78
19. The role of the researcher in collaborative action research should be limited to objective observation	3.79	.98
20. The researcher in collaborative action research is also a participant	3.84	1.11

**+ significantly greater than 4 (P < .05), **+ significantly greater than 4 (P < .01) **- significantly less than 4 (P < .01)*

collaborative action research. The participants' attitude was positive for all items. They strongly agreed with the statement that collaborative action research helps practitioners make

informed decisions regarding school issues. Moreover, they also strongly disagreed or disagreed with the following negative orientations:

- In collaborative action research we should only collect data that confirm our hypotheses
- Collaborative action research is not useful in identifying problems of practice
- Academic research leads to more objective scientific results than collaborative action research
- In collaborative action research we should only collect data that confirm our hypotheses
- In collaborative action research we should collect data that rule out alternatives hypotheses
- Conclusions drawn from collaborative action research are mainly subjective

Country Comparisons

We used a MANOVA to compare the three countries on the four subscales. The analysis shows that there was no significant difference ($P < .01$) between the countries for any of the four subscales. The means and standard deviations of the four scales are shown in Table 6.

Table 6

Means, Standard Deviation on the Four Subscales by Country

Dependent Variable	Country	Mean	S
Habits of mind subscale	Lebanon	3.67	.410
	Jordan	3.68	.399
	Saudi Arabia	3.79	.244
Inquiry subscale	Lebanon	3.28	.348
	Jordan	3.22	.436
	Saudi Arabia	3.43	.411
Orientation toward collaborative action research subscale	Lebanon	3.80	.305
	Jordan	3.94	.212
	Saudi Arabia	4.00	.273
Attitude toward cooperation subscale	Lebanon	3.94	.354
	Jordan	4.17	.305
	Saudi Arabia	4.36	.410

Length of Period in TAMAM

The majority of TAMAM joined the project and continued for the 3-years phase on the project. The remaining participants spent one year in TAMAM. We compared the two groups on the four subscales in attempt to see whether there was a significant difference between the two groups on the four subscales. A MANOVA was done using the period in TAMAM (12 and 36 months) as an independent variable and the four subscales as dependent variable. The results of the MANOVA are shown in Table 7. The mean and standard deviation of four subscales for TAMAM periods are shown in Table 8. Table 7 shows that the only significant difference (*P < .01* was in 'Orientation toward Collaborative Action Research'. Table 8 shows that this difference is in favor of those who spent 36 months in TAMAM.

Table 7

MANOVA of Period in TAMAM on the Four Subscales

Dependent Variable	Sum of Squares	df	Mean Square	F	Sig.
Habits of mind subscale	.060	1	.06	.483	.494
Inquiry subscale	.197	1	.19	1.360	.256
Orientation toward collaborative action research subscale**	.475	1	.48	8.302	.009
Attitude toward cooperation subscale	.023	1	.02	.183	.673

P < .01

Table 8

Means and Standard Deviations of the Four Subscales by TAMAM Period

Dependent Variable	Period in TAMAM (months)	Mean	SD
Habits of mind subscale	12	3.63	.417
	36	3.74	.332
Inquiry subscale	12	3.16	.344
	36	3.37	.391
Orientation toward collaborative	12	3.62	.340
action research subscale	36	4.02	.286
Attitude toward cooperation subscale	12	4.08	.336
	36	4.17	.469

Impact of Contextual Variables

Because of the small number of the members of the school team, we resorted to the qualitative analysis to account for the variance in habits of mind or inquiry skills between schools in terms of contextual variables**.** The variance was defined as the frequency of positive instances of the habits of mind or the inquiry skills in the interview data as well as the open-ended question in the Collaborative Action Research Questionnaire (CARQ). We identified the variables (for example, the habits of mind) for which there was a remarkable difference among schools (at least seven out of 15 positive instances). Next we identified the schools or schools which have the highest frequency of positive instances (denoted by 'high') and schools with lowest frequency of positive instances (denoted by 'low'). The results of this analysis revealed that schools have a substantial variance on the following three dimensions:

- Be reflective in my own professional practice (habit of mind)
- Value evidence in my professional decisions (habit of mind)
- Identify problems in my professional practice that can be resolved through research (inquiry skill)

Reflective professional practice. Two schools were identified as 'high' and two 'low' on this habit of mind. Comparing and contrasting the contextual profile of the 'high' and 'low' revealed two differences between them. First, the two 'high' schools are privately owned and are not religiously affiliated whereas the two 'low' schools are privately owned and have religious affiliation. Second, the 'low' schools have existed for decades and are recognized by their communities as very well established schools, whereas the 'high' schools are relatively younger schools aspiring for status. We conjecture that the difference between the 'low' and 'high' schools may be accounted for by the difference in their school culture. We claim that the 'low' schools entered TAMAM project with higher level of reflective

professional practice than that of 'high' schools because of their school culture that came to value reflective professional practice because of long history and affiliation.

Valuing evidence in professional decisions. One school was identified as 'high' and one as 'low' on this dimension. We attribute the difference between 'high' and 'low' schools in this dimension in terms of the orientations of the school team and its leadership. We base our conjecture on our long interaction with and knowledge of the school teams and their leadership as well as our feedback on action research school reports. These two sources point to a higher level of valuing evidence in professional practice in the 'high' school than in the 'low' school.

Using research to identify problems in professional practice. Two schools were identified as 'high' and three as 'low' on this inquiry skill. We attribute the difference between 'high' and 'low' schools in this dimension in terms of the status and mandate of the school principal. The high schools which were identified as 'high' have an administrative structure in which the 'principal' was more of an academic coordinator than chief executive officer, and that is in contrast to the 'low' schools in which the current principal was the founding principal with a strong formal and moral mandate. We conjecture that the 'low' schools with the limited status and mandate of their leadership relative to 'high' schools which have stronger status and leadership, perceived TAMAM action research experience as an opportunity to empower teachers with an evidence-base tool that can strengthen their power and status.

Organizational Change

Our model of school reform assumes that for a reform to take place, a change at the personal individual level should take place and that this change will filter eventually into an organizational change. An attempt was made to look for evidence for organizational change in the interviews as well as the open-ended question in the questionnaire. The results reveal

that organizational change was addressed by many participants as an outcome of TAMAM action research experience. Three aspects of organizational change were identified:

a. Spreading the spirit of TAMAM to the whole school.

b. Making decisions based on evidence

c. Sharing of experiences among schools- de-privatization of practice

For spreading the spirit of TAMAM to the whole school, teachers thought of informing their fellow teachers about action research, inquiry and other skills they were taught during their participation in the project. This, according to some of them would ultimately impact the culture of the school in terms of initiating reform by triggering change at the level of the school as a first step. The following are some of the excerpts from teachers' interviews that clearly illustrate this idea:

> *"I felt that this was very important, to take inquiry out of the classroom and spread it to the level of the school" (S3-3, INT)*
> *We can spread the culture of action research at the level of the school, we can solve some of the school problems, and we can improve the teaching in J1….and this is at the level of the school (J1-2, INT)*
>
> *I believe that in this way the culture of TAMAM will be transported to becoming the culture of the school (L3, INT)*

On the other hand, decision making based on evidence- empirical basis- was also a remark pointed out by some participants who expressed the necessity of basing schools' decisions on evidence for the purpose of integrating shared decision making and introducing school improvement and staff empowerment. The following excerpts illustrate this point:

> *We also changed the school policy where if we want to make any changes we have to base it on data, something empirical (J1-1, INT)*
>
> *You want the schools to take the decision as a school, on the topic they want to work on (S2-2, INT)*
>
> *So it was school based; the school took the decision (S1-1, INT)*

In addition, the third category elicited from the interviews was that related to de-privatization of practice where the participants valued the importance of sharing their

experiences in the aim of receiving feedback from others which would help them in enhancing the quality of their work. In addition, this sharing of experiences helps teachers learn from each other and gain more knowledge as illustrated in the following excerpts.

> *So school reform does not happen if each school is restricted only to itself. If we don't share, it's not going to help (S1-1, INT)*

> *From within the school there should also be a shared decision among the teaching staff themselves (S2-2, INT)*

Discussion

Results of this study indicate that the targeted habits of mind, the inquiry skills, the orientation toward collaborative action research, and attitudes toward collaboration in school teams were all positively impacted by the TAMAM project. The participants reported that their collaborative action research experience has impacted the habits of mind of openness, recognition of self and others, and being critical and reflective of professional practice. With regard to inquiry skills, the participants reported that their collaborative action research experience has impacted 14 of the 19 inquiry skills close to 'To a Great Extent' on the average, and to 'some extent' for the remaining five skills. With regard to attitude toward school team cooperation, the participants reported that they strongly agreed that their collaborative action research experience has been positive and working in TAMAM was an effective way to learn. On the other hand they have positive attitudes toward the remaining ten statements regarding school team collaboration. Finally, the participants reported positive attitudes toward collaborative action research.

Results of the TAMAM project are analogous to the ideas of Sagor (1997) and Clausen, Aquino and Wideman, 2009 who suggest that investigations involving several stakeholders working toward the same goal and being involved in individual and group reflection activities - such as collaborative action research - achieve improved performance. These stakeholders seem to be transformed into a learning community which supports the

growth and development of each member of the community. Moreover, like the subjects in Megowan-Romanowicz's (2010) and Li's (2008) research, participants in TAMAM teams might have provided them with the opportunity to practice inquiry on topics that were relevant to them and thus appreciated the importance of these skills.

By definition, action research is as a process of systematic inquiry which involves practitioners in studying and reflecting on their own practices (Capobianco & Feldman, 2010; Gall, Gall & Borg, 2005; Mitchell, Reilly & Logue, 2008). To be successful, this process requires specific habits of mind that can be acquired in the process of conducting action research. It seems that being involved in collaborative action research In TAMAM, participants developed these habits of mind that re most pertinent to them such as listening carefully and critically to arguments, remaining open to continuous learning, recognizing what they know and what they do not know, being open to the ideas of others when taking decisions, being critical of their practices and those of others, and being reflective their own professional practice.

Finally, it seems that the fact that TAMAM teams worked together on a problem relevant to them and to their school for an extended period of time, their interaction with teams from other schools and other countries, and their realization of the importance of de-privatization of practice allowed them to develop productive relationships in their own teams and with other teams leading them to develop positive orientations toward collaborative action research and positive attitudes toward collaboration.

Results of this study also show that there were no differences among the three countries on any of the subscales of the questionnaire. Moreover, the only difference between the countries that spent three years and those that spent one year with TAMAM was on the "Orientation toward Collaborative Action Research" subscale. This difference seems reasonable given the fact that teams who spent 36 months in the TAMAM project had enough

time to experience the whole cycle of action research and practice it in different project while those who had only one year had very limited experience in action research and thus did not have the depth of knowledge that would allow them to appreciate this type of research fully.

The interesting and novel findings from the TAMAM research are those related to the contextual factors variables. Results indicated that schools varied on dimensions related to habits of mind and inquiry skills. The variance could be associated with the schools' affiliation and the status of the school. What is interesting is that the schools that were established and affiliated to religious organizations came with a rich background of experiences and thus the experience in TAMAM might have reinforced rather than improved their habits of mind such as being reflective and valuing evidence. Another contextual variable that appeared to influence how school reacted to the TAMAM experience was the type of principal of the schools. Schools in which the principal did not have a strong formal and moral mandate and was more like a coordinator were more influenced by the TAMAM experience. A third contextual variable that appeared to influence the inquiry skill of seeking evidence in professional was the orientation of the school team and its leadership. What is interesting about the above findings is the realization of the important roles played by contextual variables in engendering successful change in schools. The lesson learned from these findings is that educational change is a complex process that should take account of local factors in the school itself and in its environment that determine the success of failure of a reform effort. These findings give more credence to school-based rather than ministry of education-based reform activities because locally initiated activities have more intimate and deep understanding of the local context and thus have better chances for success.

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Dear Colleagues,

Attached please find the "Collaborative *Action Research Questionnaire (CARQ)*" that was developed by members of the AUB TAMAM team. PARQ is composed of three parts:

- Part A: Collaborative action research as an inquiry..
- Part B: Orientation toward Collaborative action Research.
- Part C: Attitudes toward School Team Collaboration.

The purpose of the questionnaire is to gauge TAMAM school team members' understandings of and orientations toward collaborative action research and their attitudes toward team work. The results of this questionnaire will be essential in our attempt to understand how involvement in collaborative action research has influenced reflective practice at TAMAM schools.

We want to assure you that your answers to the questionnaire will be treated with the utmost confidentiality and that no names or identifying information will be used in any research report that results from this research. Moreover, the results of this research will be shared with TAMAM team members as well as with the education community.

Please contact us if you need more information.

Saouma BouJaoude and Murad Jurdak

Collaborative Action Research Questionnaire (CARQ)

Name:

School:

Number of months with TAMAM Project:

Subjects taught:

Grade levels taught

Number of years of teaching experience:

Collaborative Action Research Questionnaire (CARQ)

Dear Respondents:

The "*Collaborative Action Research Questionnaire (CARQ)*" is composed of three parts:

- Part A: Collaborative Action Research as an Inquiry.
- Part B: Orientation toward Collaborative Action Research.
- Part C: Attitudes toward School Team Collaboration.

For each item of the Questionnaire, please select the response that best represents your assessment or opinion by putting a check mark (√) in the appropriate box.

Part A: ***Collaborative action research as an inquiry***

My collaborative action research experience in TAMAM contributed to my ability to:				
	Not at All	**A Little**	**To Some Extent**	**To a Great Extent**
1. Identify problems in my professional practice that can be resolved through research				
2. Define research questions that can be answered through research.				
3. Identify and analyze several alternative answers to research questions.				
4. Identify data sources that are aligned with the identified research questions.				
5. Select data collection tools that are aligned with the identified research questions.				
6. Construct data collection tools that are aligned with the identified research questions.				
7. Plan appropriate procedures for data collections.				
8. Be aware of school contextual factors associated with selecting, constructing, and administering data collection tools.				
9. Select appropriate data analysis methods.				
10. Design and conduct an inquiry.				
11. Derive research questions from research articles.				
12. Use appropriate quantitative and qualitative data analysis methods.				
13. Insure the reliability of qualitative data analysis.				
14. Summarize and organize the data to answer the research questions.				
15. Develop explanations/interpretations of results based on evidence				
16. Analyze alternative explanations/interpretations of results.				

17. Write a research report that communicates the purpose, procedures and interpretations of an inquiry.				
18. Present a research report that communicates the purpose, procedures and interpretations of an inquiry.				
19. Argue in support of the findings of a research study.				

For each item, please select the response that best represents your assessment or opinion by putting a check mark ($\surd$) in the appropriate box.

Part B: ***Collaborative action research as a habit of mind***

My collaborative action research experience in TAMAM contributed to:				
	Not at All	**A Little**	**To Some Extent**	**To a Great Extent**
1. Being reflective in my own professional practice.				
2. Being critical of my own practices and those of others.				
3. Valuing evidence in my professional decisions.				
4. Being open to the ideas of others when taking decisions.				
5. Listening carefully and critically to arguments.				
6. Being accountable for what I say and write.				
7. Coming up with innovative solutions to problems of practice.				
8. Taking responsible risks.				
9. Recognizing alternative explanations.				
10. Questioning the opinions of others.				
11. Remaining open to continuous learning				
12. recognizing what I know and what I do not know				

For each item, please select the response that best represents your assessment or opinion by putting a check mark (√) in the appropriate box.

Part C: ***Orientation toward Collaborative Action Research***

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. Collaborative action research helps practitioners to make informed decisions regarding school issues.					
2. It is practical to conduct collaborative action research in school settings.					
3. Academic research leads to more objective scientific results than collaborative action research.					
4. The goal of collaborative action research is the same as that of academic research.					
5. Collaborative action research is not useful in identifying problem.					
6. In collaborative action research we should only collect data that lend themselves to statistical analysis only.					
7. In collaborative action research we should only collect data that can be analyzed easily.					
8. In collaborative action research we should only collect data that confirm our hypotheses.					
9. In collaborative action research we should collect data that rule out alternative hypotheses.					
10. In collaborative action research we should only analyze data that confirm our hypothesis.					
11. In collaborative action research we should analyze data that rule out alternative hypotheses.					
12. Conclusions drawn from collaborative action research are mainly subjective.					
13. Qualitative data help in understanding the reasons behind findings from research.					
14. Quantitative data help in establishing relationships and understanding them.					
15. Conclusions drawn from collaborative action research apply only to the specific context in which the study was conducted.					
16. The “voice” of the researcher is an important component of the collaborative action research report.					
17. In writing a report of an action research, detailed description of the context in which the collaborative action research study was conducted should be avoided.					

18. In writing a report for an action research, description of the actions of the researcher while doing the study should be avoided.					
19. The role of the researcher in collaborative action research should be limited to objective observation					
20. The researcher in collaborative action research is also a participant.					

For each item, please select the response that best represents your assessment or opinion by putting a check mark (√) in the appropriate box.

Part D*: Attitudes toward School Team Collaboration*

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1. My experience working in TAMAM school team has been positive.					
2. Working in TAMAM school team was a poor way to learn.					
3. I feel comfortable interacting with other members of my team.					
4. In my experience, team members usually do their fair share of work.					
5. I feel uncomfortable interacting with members of other teams.					
6. Teams produce low-quality work.					
7. I prefer a learning experience that involves working in teams over one that does not.					
8. I would like to work in a team, even if someone else chose the members.					
9. I feel uncomfortable giving feedback to team members.					
10. I get concerned that I might embarrass myself when I share my ideas in front of my other team members.					
11. I get concerned that I might embarrass myself when I share my ideas in front of members of other teams.					
12. In TAMAM school teams there was adequate recognition of the contribution of each team member.					
13. The presence of members of the school administrators in the team inhibits openness.					
14. The participation of members of the school administrators in the team enhances the effectiveness of the team.					

Use the space below to answer the following question. If you'd like to answer in Arabic, please send in your answer via email to jurdak@aub.edu.lb and boujaoud@aub.edu.lb.

- **What are the most important lessons learned from your Action Research experience in TAMAM?**