Technology in Educational Evaluation – Opportunities and Challenges

A dialogic tool to express student positions towards school systems

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In recent years, the use of online tools has increased in the field of evaluation. Although the main use of online tools in education has been for assessing students achievements, this paper will address the use of such tools for evaluating educational programs and projects. The principles will be presented by means of an example of online students feedback as part of a system of online surveys conducted about enrichment programs attended by these students. The system facilitates the utilization of a broad-spectrum feedback program. In addition, the feedback serves as a tool through which students can participate in the assessment process and make their voices heard in the decision making process. The advantages of computerization, as well as its difficulties, trace back to both technical aspects of the process and to ramifications of the process. This paper presents the complexities as well as the advantages of the continuous use of online systems for ongoing assessment. We present the ways in which we try to minimize complexity and the aspects about which there is still disagreement, but we also issue a clear call for increased use of this type of system in order to conduct quality assessment of large and otherwise silent populations.

Introduction

In this paper we examine the role of a computerized evaluation tool in school educational processes. Based on the complex systems theory, we will identify schools as complex, multi-player, often on-edge-of-chaos systems. In such systems, in order to get a system out of a nearly-chaotic state and reshape it, a significant role should be given to *feedback* obtained from the various players of the system.

In the paper we argue that evaluation processes, even when taking place at the margins of a system, can serve as important tools in feedback processes which required in complex systems in general, and in schools in particular. In addition, we argue that the presented evaluation tool gives voice to major players of the system – students and parents – who often are the *subjects* of evaluation and examination while their direct voice is not heard and not taken into account by the system. In the case we present, however, such players do express their stance towards the system, and this stance, along with the educational staff's positions, is used as an important resource for the school's decision-making.

The online tool presented here was built in and is operated by the evaluation unit of *the Karev Program for Educational Involvement* all over Israel,

The Karev Program for Educational involvement is a joint initiative of the Ministry of Education and the Karev Fund. The program promotes social-educational change, and encourages equal opportunities and the reduction of gaps within Israeli society, through enrichment and empowering activities in educational systems. After two decades of activity,

the program is the largest educational intervention program in Israel, which serves over 260,000 children and youth, in approximately 120 local authorities.

The operational concept of the program is based on a humanistic approach, which seeks to encourage and promotes the extraction of capabilities, self-initiation, responsibility, and dialogue within educational systems. The program assists children in the various sectors of the Israeli society – peripheral communities, new-immigrant neighborhoods, the Arab sector, the orthodox educational system and more. In addition, the program promotes social-educational issues of national importance, such as new-immigrant engagement, violence-prevention, environmental awareness and more.

Since the establishment of the Karev program, there operates within it an internal evaluation unit, which services program clients and operators at all levels. Over time, the unit conducted scores of evaluation studies, out of which it has produced evaluation reports covering the various pedagogical, managerial and ideological issues faced by the program.

Complex systems – A literature review

Complex systems

The Complexity-System Theory is an organizational theory emphasizing communication, interactions, and interdependencies between individuals and institutions as key factors of the social order. It draws ideas from the *Chaos Theory*, *network-research* and the *Complexity Theory* of the empirical and natural sciences (Holmwood, 2005; Lansing, 2003; Gilchrist, 2004; Efron & Yehazkeli, 2007). In fact, according to the theory, a social system is the communication which takes place between people and groups who are included in it (Luhmann, 1995).

According to the complex systems view, in different societies there are several common guiding-principles, reflected in the following terms: *Self-organization*; *Emergence*; *Connectivity*; *Interdependence*; *Feedback*; *Far from equilibrium*; *Space of possibilities*; *Co-evolution*; *Historicity & time*; *Path dependence*; *Creation of new order* (Mitleton-Kelly, 2003). In this paper we will refer to some of these principles and will use them to explain the potential impact of the presented online feedback tool upon its environment.

The complex system approach also put emphasis on the place of *chaos* in social systems. The Chaos Theory suggests that in complex systems *order* coexists with *disorder* ('walking on chaos-edge'), and when complex systems move from order towards disorder, argue the theory, new action-patterns may be formed[1] (Mitleton-Kelly, 2003).

Schools as complex systems

Complex systems are systems that operate within multi-player environments. In theory, entire societies and cultures ('social systems') can be seen, according to this paradigm, as collections of 'players' and 'links' ('nodes') where interactions take place between the players. As the number of players in a system grows, greater become the communication-difficulties,

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1   It is true that caution should be taken when using the Chaos Theory to analyze social systems, because of the differences between nature and human systems (which relate, principally, to cognitive processes). It seems, however, that the importance of the chaos aspect in complex social systems is large, and therefore it shouldn't be ignored.

uncertainty, and risks within it. Pieterse (2004) argues that complexity levels of social systems increased in recent decades, and, as a result, greater are now the difficulties in information-distribution and in the coordination of activities between the various components of the systems. According to Granovetter (1983), 'weak ties' in social networks may serve as a catalyst for possible change-processes. Weick (2001) argues that open and broad communication (i.e. high ability to process and disseminate information and knowledge) improves the ability of organizations to function in complex environments. Weick (1976) also maintains that educational organizations, including schools, can be identified as complex organizations which are multi-player (with students, parents, teachers, authorities, Ministry of Education, etc.), have multiple links, and operate in complex environments. In addition, he claims, such organizations also tend to have 'loosely coupled' structures.

Evaluations' role as change-agents in complex systems

Another major characteristic of complex systems is that they are almost always bordering imbalance states. According to the complex systems theory, implementation of innovations into a system is made possible when this system passes a 'threshold', an 'edge', and reaches an imbalanced state – 'far from equilibrium' – where it can create a new order through internal 'Self-organization'.

The destabilization may be caused by different sources (internal or external), and can bring unpredictable changes. Sometimes, like an invisible whirlpool, an unseen change that approaches from the fringe is what brings the change, and this is why it is sometimes so difficult to predict the consequences of such changes. When the system reaches the edge of an unbalanced state – 'far from equilibrium' – it becomes sensitive and vulnerable, and feedback becomes essential for the generation of a renewed self-organization. Actually, according to the theory, a system *must* have constructive, effective feedback in order to avoid collapse, and therefore, in an ever-changing environment, a system *must* improve and change its feedback processes and make them relevant and effective (Mitleton-Kelly, 2003).

In this paper we argue that evaluation processes, even when not in the center of complex organizations, still have an important role in change-processes – they cause a 'controlled destabilization' of the system's equilibrium, and thus force the system to adapt itself to the changing environment. In our specific case of online students' feedback, we argue, the environment is one in which the call is growing to listen to the voices of students and parents when pedagogical decisions are made. The proposed evaluation process, we claim in this context, is a catalyst to system equilibrium destabilization, which provides an effective feedback – an important communication channel for the system players – and by this helps the system to reorganize itself.

Evaluation of programs and instructors by students – a tool for community empowerment and participation in change-generation

This paper presents a unique evaluation tool for school enrichment activities. The tool is based on a computerized questionnaire distributed to students, with questions related to several educational aspects of activities they had experienced during the year. Review of the literature dealing with school-evaluation studies reveals our proposed tool as *unique*, in regards to evaluation objects, target audiences and data collection methods, as detailed below.

A. Evaluation objects and target audiences: student evaluation in enrichment programs

The evaluation tool, the center of this article, examines supplemental enrichment programs, which operate as part of a standard school-day, and are selected, annually, by school steering-committees made up of parents and school staff. Darling-Hammond et al. suggest that the evaluation roles of teaching-programs and school-teams should be devided into two groups: A) Evaluation aiming at providing instruction teams with professional improvement tools. B) Evaluation aiming at providing a decision-support tool to school principals and educational policy-makers (Darling-Hammond, Wise and Pase, 1983). We will focus here, however, when analyzing the role of the proposed tool, on its role as a tool aimed at helping school stakeholders (parents, teachers and administrators of schools and local authorities) to evaluate enrichment programs from the students' perspectives. In research literature no documentation was found for similar evaluation tool designed for involving the community (in addition to officials) in school pedagogical decision-making processes.

B. Data collection: Students' instructor- evaluation with computerized questionnaires

As indicated above, research literature recognizes the importance of reliable, useful tools for teacher-evaluations. However, very few evaluation methods and tools give place to *young students' voices* in evaluations of teachers and instructors of *lower* schools (elementary and junior high schools). Student teacher-evaluations in *academic* educational institutions *are* widely conducted, though, and accordingly, since the 1970's, much literature has dealt with these evaluations in such institutions (Madden, Dillon and Leak, 2010). The main questions with which these studies are dealing address the reliability and usability degrees of such evaluations (Audhesh and Young, 2002). At the base of these studies has been, primarily, the assumption that positive students' evaluations of their teachers are connected with better achievements of these students (Cohen, 1981). Other studies in this field deal with low student responsiveness when evaluation questionnaires are filled out by students independently through computers and the Internet (Xenos and Papadopoulos, 2007).

Unlike academic teaching frameworks, however, implementing student and parent evaluations of teachers in *lower* (younger) educational frameworks is much less common. A recent (2013) survey, conducted in economically-developed countries (OECD) revealed that very few countries apply in low-level (younger) school-frame student-based teacher-evaluations (Mexico, New-Zealand, Slovakia, Korea and the United-States) or parent-based teacher-evaluations (Canada and Poland).

In recent years there did appear, however, a small number of tools aimed at evaluating teachers by students of low-level schools (including kindergartens). Some prominent amongst them (in English) are the following: Tripod[2], YouthTruth[3], My Student Survey[4] and iKnowMyClass[5].

Most of these tools can be implemented through computerized systems, and are operating by measuring 6-9 characteristics ('aspects') associated with effective teaching. In order to do

[2] *http://tripodproject.org/*

[3] *http://youthtruthsurvey.org/*

[4] *http://mystudentsurvey.com/*

[5] *http://www.iknowsurvey.com/iknowmyclass/?loc=US*

this they utilize 20-80 questions, most of them closed-ended questions that require a selection of one of five possible answers (a detailed comparison between the tools can be seen in MET, 2013 pp.7-8). A comprehensive study based on the Tripod tool and conducted among 3,000 teachers in the United States over a three year period, found that the use of student teacher-evaluations, combined with student achievement-measurements and classroom-observations, allow for discovery of the outstanding teachers within entire teacher communities. In addition, the authors also conclude that an effective evaluation of school educational processes should involve all relevant stakeholders (MET, 2013), a view which is also a guiding principle of our proposed computerized evaluation tool, which we will now introduce.

Students' online feedback

The tool

From its earliest days, evaluation and feedback have been integral parts of the Karev educational activities. In recent years, however, evaluation and feedback methods have been upgraded into a unique, 'in-home', online system, of which one major capability is its ability to acquire students' feedback regarding enrichment classes in which they participate.

Schools interested in such feedback start the process by filling out an order form, where they select targeted programs and instructors, and suitable survey dates. At the selected time students are gathered into school computer classrooms, and fill out the survey forms for the selected programs. The next day, the school principal and the Karev representative log into personal area of a dedicated site, where they can examine the complete finding report.

There are three types of questionnaires, depending upon students' age-levels (grades 1-2, 3-6, 7-10), each one available in both Hebrew and Arabic versions, from which the students can choose. The questionnaire has a simple, convenient design, and questions are mainly closed-ended, where students only need to mark the appropriate answers (for example – selecting from a program-list a specific enrichment program to which they are referring, selecting an agreement-level with statements relating to specific enrichment programs, etc.). In rating questions there are also 'emoticons' attached to the various options. The forms for the youngest ages (grades 1-2) contain only a few questions, each accompanied by a picture. Forms targeted to the higher grades (grade 3 and older) also include two or three self-expression ('open-ended') questions, where students are asked to briefly describe the main things which they like and the main things they don't like about the program. In cases where they indicate they don't want to continue the program, they are also asked to explain why. The data obtained from these 'open' questions complement the quantitative data of the selection 'closed' questions.

The fact that the questionnaire has been built by the program evaluation unit ensures its reliability and validity. The use of the questionnaire is uniform, which allows for finding-examination on a systemic level and for a long-term trend-analysis.

The reports

The feedback data enables the production of several kinds of reports, all automatically system-generated and ready to use one day after the forms have been completed.

School report – For each school, reports are available by age-levels of students who filled out the forms (1-2, 3-6, 7-10). Each report contains summarized findings for each of the evaluated programs and for each age-group. The report presents quantitative data (answers'

averages and distributions), as well as qualitative data (students' answers to the open questions).

Local coordinator report (Karev project manager) – Each local coordinator can access all the reports of all schools under its responsibility. (These reports are the same as school-reports).

Enrichment-program report – For each enrichment program all reports are available for each school whose students filled out feedback forms for that particular program. The reports, however, include only data relevant to the specific enrichment program. These reports are also divided according to age-groups (1-2, 3-6, 7-10).

Local authority report – A report which provides a 'general picture' for the local authority, and includes general information on Karev activities in this authority (number of instructors, main subjects of active programs, etc.), as well as summarized data received from the authority's students.

As with student-feedback forms, report findings are also structured in a simple, straightforward design, and are based on the understanding that they are directed to populations with no statistical expertise. The findings are presented in a graphical, colorful display, and include textual explanations, tables, and charts with descriptive indicators (answer distributions and averages), national distribution charts and transcripts of students' answers to the open questions.

Using the feedback tool – the technological aspect

As mentioned, the use of students' feedback began before the computing era. However, the transition to an online system opened up new opportunities, as detailed below:

1) A significant expansion in the number of the received feedback responses (hundreds of thousands of students from hundreds of schools).

2) Almost immediate availability of results following questionnaire completion.

3) Generation of general, organizational reports, alongside specific designated reports for the different stakeholders.

4) Generation of a multi-year feedback database, which serves as a resource for ongoing learning and research.

5) Task obsolescence – elimination of form typing and printing, and report analysis and writing.

6) Immediate availability at any time and with no geographic limitations.

The feedback tool in school steering committees

According to Karev policy, a steering committee, consisting of school, parents, and Karev representatives, converges during and at the end of each year to discuss and set the program operation-plan and the specific enrichment programs which will run in the school during the year. These steering committees demonstrate major Karev principles – dialogue and parent involvement in educational activities.

In the past, there was no systematic student representation in steering committees, and students opinions were mainly heard through parents and school staff who represented them. Now, through the online feedback tool and reports, it is possible to supply these committees

with authentic, systematic student voices regarding the enrichment programs in which they participate.

The feedback tool as a Karev worldview representation

The use of online feedback forms allowed for standardization of the questionnaires used in program evaluations. Unlike past situations where each school built its own questionnaires, the present online tool is uniformly used in all schools and programs, is built according to the program's educational worldview, and reflects the criteria defined by Karev as relevant to enrichment-program characterization.

Tailoring the tool to target populations

The widespread use of the tool and the wide range of its recipients raised the issue of how to use the findings. As noted, reports are generated and made available to schools, enrichment programs and local authorities. Recipients, for the most part, are not evaluation or research professionals, and are not proficient in the use of evaluative reports. To address this issue the evaluation unit took two steps: One – to each report it added an instruction section which explains how to use the report, the statistical terminology, and the meaning of the gathered data. The second step – guidance workshops for the various recipients of the reports. Thus far, several joint workshops have been conducted, with participants from several schools of the same local authority (or several nearby authorities), who represent schools that apply the tool and are planned to present the findings to their Steering Committees. In the workshops it is explained what can be learned and what can't be learned from the reports, and emphasis is also placed upon the need to address *school-contexts* of the data, which the reports do not reflect (e.g. – number of students in the class, student-group profiles, etc.). For next year similar workshops are planned, this time also for the enrichment-program *professionals* who use the reports.

Student feedback – issues and discussion

The transition to an online evaluation tool derived from the need to deal with challenges such as: The need to respond to diverse target audiences; the need for a centralized database to serve programs' ongoing work; the need to generate specifically tailored reports for various evaluation clients, and more. The fulfillment of these needs exceeded all expectations, and as a result feedback is increasing every year. Also, more and more became the enrichment-program evaluation tool a de-facto feedback tool for entire school organizations and a catalyst for potential changes in them. Some of these changes have already begun, along with the increasing demand and the expanding audiences. This expansion, probably, indicates a *consciousness shift* – a growing understanding of stakeholders as for the importance of student and parent voices. And regarding the long-term effects of the feedback tool, this, it seems, is worthy of further study within a few years. Additionally, in the future, perhaps there will also be room to examine whether the feedback provided by the tool supports school reorganization also in areas where it doesn't deal directly.

The change caused by the tool had unexpected consequences, for many evaluation areas and participants, which, in turn, led to further reciprocal effects and changes. Changes occurred in the nature of evaluators' work and roles, in their activity scopes and audiences, in organizational practices, and in methods of design and construction of tools and online forms. It seems, however, that most significant has been the effect of the tool on sharpening the awareness of us, the evaluators, regarding the large potential of a participatory evaluation culture being integrated into the Karev educational concepts and unique intervention culture.

This culture, which, we believe, can be largely promoted by the presented tool, consisting of several principles:

A. Implementation of social perception which encourages more voices in educational processes – Evaluation of the type described here invites more democratic processes and allows wider circles of participants to be heard and to participate in shaping educational processes (Daigneault & Jacob, 2009; Salomon, 2000).

B. Presenting an evidence-based decision-making model – Evaluation tool like the one presented here support practical implementation of findings and recommendations, as it enables decisions based upon valid, reliable evidence, carried out in a timely manner (Patton, 2002).

C. The establishment of continual learning and exploration processes – The evaluation processes described here produce, as an organizational work-routine, inquiry and learning cycles aimed at improving and promoting organizational activities and enrichment programs. The expanding circles of evaluation participants produces, in turn, more exploration circles, and thus make the foundation for continual organizational learning growth (Cousins et al., 2008).

The feedback process described here and its implications are in a constant experimentation and examination state, which allows us to see how, aside of the many benefits, the process also bears a price and raises problems, such as the following:

A. 'The Big Brother' – The high accessibility to data, and the control of so many comprehensive findings, produce in some organization members a sense of 'too much exposure' and a fear of 'the Big Brother eye'.

B. The 'Rating control' – Most reports are based on one evaluation tool (the feedback questionnaire) and one information source (students or teachers), which sometimes causes excessive weight to be given to the findings, while the various *contexts* in which the findings are located, are ignored.

C. Biased usage – Due to the transparency of such comprehensive findings and the large scale in which they are distributed, there is no effective way to control how they are used. There is, sometimes, a partial, even tendentious or distorted use of findings by system participants and even the media.

D. 'Who are we?' – Role-divisions between evaluators and organization officials have changed. Previously, evaluators would take care of local unit requests first, but the changed tools and data scopes have made the evaluation unit a central organizational unit that cannot always make adjustments for specific local needs.

The broad changes brought on by the proposed tool, that started from a narrow, practical need, of providing better support for growing number of stakeholders, brought us, eventually, to a renewed contemplation of the very basic evaluation questions. The online technology enables a huge increase in the number of evaluation clients, and, at the same time, makes these clients active participants in many parts of the evaluation process. This combination necessitates a re-dealing with the question of how "the unbearable ease" of producing evaluation questionnaires and reports will enable process democratization on the one hand, while on the other hand not create a 'mechanical' process resembling a 'ratings survey'. The new technology also encourages us to re-examine old questions, such as:

Where are the *boundaries* between evaluator, the evaluated, and the evaluation client? And how can we *differentiate* between them, when *all of them* are actually engaged in the evaluation? And what are the necessary professional skills for evaluators in a reality in which they should address such a large variety of stakeholders? And how can we know that all process participants mean the same things, or, in other words – how can we produce a *shared common language* for both the various stakeholders and evaluators?

Dealing with all these challenging questions, through experience, exploration, and extraction of knowledge out of the process, this is our next destination.

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