# Levels of reflection in action research. An overview and an assessment tool ☆

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## Abstract

This is a preliminary study that examines prospective teachers' reflective thinking as it is exhibited in their action research during the teaching practice experience. Different systems of analyzing reflective thinking are reviewed and criticized for their suitability for analyzing written journals rather than other forms of expressing and developing reflection. An inventory for analyzing student teachers' reflective thinking during action research is constructed and validated (IRTAR). It is then used for analyzing action research reports of hundred prospective teachers. The results of the analysis are discussed within the context of teacher education programs in Egypt.
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## 1. Introduction

One can hardly find a journal or a book on teacher education now without the centrality of the idea of reflective thinking to the work of the teacher and the goals of teacher preparation programs. Still however there is no common definition of reflective thinking (Freese, 1999). In spite of this reality, there is always the tendency to use the dichotomy of reflectors and non-reflectors. In a recent workshop that aimed at initiating an Academy for Reflective Practices (ARP) in Egypt, funded by the USA, a number of the participants were quick to label Egyptian teachers as non-reflectors relying on a belief that certainty can be attained in describing human ability and development. Other members were skeptical about this approach to classifying teachers given the fact that there is no agreed upon definition of reflection. This event was one of the reasons behind the initiation of this study to first, examine the constituents of reflection, and their measurement. The other reason was to assess the nature of prospective teachers' reflective thinking through one teacher preparation activity that is action research.

## 2. The illusive reflectivity concept

In spite of the fact that the term "reflection" is not new since Dewey originated it in 1903, it still raises debates and discussions as to its constituents, defining attributes, development and measurement. Some refer to it as comprising a "complex array of

cognitively and philosophically distinct methods and attitudes.'' (Van Manen, 1977). Van Manen (1991 cited in Galvez-Martin, Bocoman, & Morrison, 1998) defines reflection as ''the process by which teachers engage in aspects of critical thinking such as careful deliberation and analysis, making choices, and reaching decisions about a course of action related to teaching.'' (p. 9) Ross (1989 cited in Galvez-Martin, 1998) defines reflection as ''a way of thinking about educational matters that involves the ability to make rational choices and to assume responsibility for those choices.'' (p.22). Dewey (1933) argued that reflection comprises several steps including (1) doubting and feeling perplexity in relation to a given situation, (2) tentatively interpreting the possible meanings of the situation or factors involved in it and their consequences, (3) examining/exploring/analyzing all considerations that might help clarify the problem, (4) elaborating the preliminary hypotheses, and (5) deciding a plan of action. Van Manen (1995) maintains that ''A proper sequencing of such reflective steps make up reflective experience which in turn can lead to analysis and evaluation, then to further reflective action.'' (p. 34).

Adopting reflection as an important goal for teacher education programs created a pressing need for ways of measurement. When a construct guides the work of a training program, and when it provides the rationale behind adopting particular training practices, evaluating the outcomes of training becomes an inevitable necessity. The pragmatic need for evaluation, in fact, helped in moving reflection from an abstract, illusive idea to a concrete and measurable construct. However, the endeavor to find methods for measuring or quantifying reflective thinking remains relatively new.

The valuable contribution of scholars involved in measuring reflection is that they build their views on the premise that all human beings are capable of reflection. It is not a question of whether an individual is reflective or not but rather at what level of reflection a person is operating. Just as it is the case with any human trait, people are stratified over a continuum from poor to average to extraordinary with infinite points in between. Reflection is conceptualized as a human trait that exists in varying degrees in different people. This developmental conceptualization imposes a set of new questions for investigation, i.e. would people grow reflective, as they grow older? Would reflective thinking just happen with maturity and life experi-

ence? Would reflective thinking develop without training or probing? Would it then be realistic to assume or expect students who have more teaching experience to be more reflective than less experienced students? Would veteran teachers acquire reflection as a result of years of experience as opposed to novice teachers? In order to be able to tackle some of these questions, tools are needed to assess people's level of thinking at one point of time as well as measure the development of that thinking over time, within given activities, or before and after different modes of training. This study develops a tool to describe prospective teachers' reflective thinking during the course of one teacher preparation activity that is action research.

## 2.1. Research questions

(1) How would reflective thinking of prospective teachers in their action research be assessed?
(2) What levels of reflective thinking would prospective teachers exhibit in their action research?

## 3. Method

### 3.1. Research setting

Faculties of education in Egypt are in charge of preparing teachers in all subjects. Prospective teachers enroll in these faculties after they earn their high school diploma. During their first year in the program, prospective teachers of English as a Foreign Language (EFL) study specialized subjects such as phonetics, grammar, writing, and literature as well as one course on principles of education and one on principles of psychology. During the second year, students continue their studies of specialized subjects in English in addition to a general introductory course of methods of teaching. Prospective teachers start their exposure to methods of teaching English as a Second/Foreign Language (EFL/ESL) and actual teaching practice in schools in the third year. The same arrangements (one methodology course and a teaching practicum) also take place in the fourth year. College classes are usually very large (up to 250 students).

In spite of the fact that students remain in college for 4 years, the ''hands on experience'' of teaching remains limited to two courses in two semesters which is a total of 26 weeks and two practica. The limited time given to these courses and to teaching

practice, huge classes, and lack of teaching assistants double the effort and the responsibility of the teacher educator who teaches these classes. Achieving a balance between providing prospective teachers with the knowledge base needed, developing their teaching skills and stimulating their reflective thinking becomes a daunting task (El-Dib, 1992). This status quo often forces instructors (who change regularly) of these courses to neglect one aspect for the sake of focusing on others depending on their own philosophy and conviction of what is important for teachers. Unfortunately, reflective thinking is usually the one aspect that gets neglected. Yet, the researcher who was also teaching these courses had the development of reflective thinking as one of her important course objectives. Therefore, doing action research was required as a means towards fulfilling this objective.

### 3.2. Participants

Two hundred and thirty students were enrolled in the third year and 250 students were enrolled in the fourth year. They were all required to conduct action research during their teaching practice experience. Out of the 230 third year students, 163 submitted action research reports. Out of the 250 fourth year students, 159 students submitted their studies. Fifty students of each group were randomly selected. Students were at the age of 20–21.

The large number of students not submitting their action research reports is probably due to the fact that, according to the rules and regulations of the faculty, the number of scores designated for course work (attendance, assignments, action research reports, etc.) only constitutes 20% of the total score for the course. Eighty percent of the score are designated for one final written exam. Unfortunately, many students opt for not submitting course work.

### 3.3. Procedures

Student teachers were introduced to action research and its principles during their EFL methodology course by reading an article entitled, "Teacher Initiated Research" (Onel, 1997) about the processes of action research. One lecture (3 h) was devoted to the discussion of the article and the processes. Student teachers were then required to conduct an action research study during the practicum.

Since reflection is an inseparable component in the research process, and since the purpose of the study was to assess the participants' thinking as reflected in their research reports, the researcher did not interfere in directing or coercing the participants on how they should think or express their thinking.

Prospective teachers chose freely their problem areas and their way of approaching them. All students were required to submit written reports of their research after they finish their practicum.

The following step was examining these research reports for evidence of reflective thinking. This is when the need for a different tool of analysis more suited for the complex and multi level nature of action research was perceived. There was a need to review how others have operationally conceptualized reflective thinking beyond mere theoretical definitions.

## 4. Review of literature

### 4.1. Schemes for analyzing reflection

Van Manen (1977) wrote an influential paper where he made a pioneering attempt to define reflectivity as comprising three levels. At the first level, the teachers' dominant concern is with technical rationality (Van Manen cited in Smith, 1992). Teachers at this level are primarily concerned with applying knowledge in order to reach predetermined educational objectives. The end objectives are not questioned. The actions taken are evaluated on the basis of its effectiveness, economy, and efficiency. A higher level of reflectivity goes beyond technical rationality into investigating, questioning and clarifying the end objectives and the assumptions behind teaching activities designed to achieve those objectives. The third and presumably highest level of reflection is that of critical reflection. At this level, the teacher is not simply concerned about the goals, the activities and the assumptions behind them but he is rather reflecting upon the larger context where all education exists. He is incorporating moral and ethical questions into his line of thinking.

Brookfield (1995) focuses on critical reflection defining it as characterized by two features: "the first is to understand how considerations of power undergird, frame, and distort educational processes and interactions. The second is to question assumptions and practices that seem to make our teaching lives easier but actually work against our own best

long-term interests." (p.8) Brookfield (1995) does not reject other types of reflection; he rather maintains that it is possible to teach reflectively while concentrating on the details of every day class. This type of reflection resembles technical reflection according to Van Manen (1977).

Brookfield (1995) gives illuminating examples of the nature of critical reflection as hunting assumptions. He asserts that lack of critical reflection habits makes us fall into actions based on unexamined assumptions. He is one of the very few educators who gives concrete examples of what he means by critical reflection. For example, it is common sense that a teacher visits groups during their group work demonstrating his commitment to help them learn. Viewing this common-sense-based action from a different angle considers the possibility that students might during these teachers' visit to their groups show different behavior from what they do in his absence. Obviously, they might attempt to show how they work on task rather than being actually involved in the task.

The idea Brookfield (1995) advocates is that teachers ought to investigate and question their assumptions and search for multiple perspectives. Only this way, he asserts, they could become critical reflectors.

Zeichner and Liston (1987) adopt a definition of reflection inspired by Dewey's work that encompasses two levels of reflection. The first level is routine action, which is guided by outside authority without giving thought to justifications for the actions taken. The second level is reflective action, which is inspired by the concept of a teacher as a moral craftsperson who is concerned with the ethical issues involved in carrying out certain actions.

In 1987, Schon lamenting the undervaluing of teachers' knowledge by professional education, distinguished three forms of reflection but not in a developmental sense (Schon, 1987). These are reflection-on-action, reflection-in-action and reflection-for-action. The first is when one reflects on action that had already taken place. An example of this would be a teacher thinking about something that he did in class after the class is finished. Reflection-in-action takes place during the action itself. Finally, reflection-for-action is what guides the teacher to think and plan for his future actions (Yost & Sentener, 2000).

Ross (1989, cited in Galvez-Martin et al., 1999) analyzed reflection into three developmental levels including low level where a student gives examples, describes practices or agrees with positions in the literature. Moving up Ross' scheme into a moderate level of reflection, a student teacher provides good critique for practice from one perspective, analyzes in more details teaching practices and recognizes that instruction must vary to meet different demands and needs of different situations and students. The highest level of reflection is shown when a student teacher starts to view things from different perspectives, and recognizing the impact of teachers' actions that go beyond classroom settings.

Galvez- Martin et al. (1998) provide a seven-level scheme of reflection ranging from zero where a student teacher does not mention (in his journals) pedagogical concepts or skills to seven where he again evaluates instructional/non-instructional events from multiple perspectives. At the highest level a student teacher realizes the impact of context on the events and goes further into envisioning improvements and giving suggestions and recommendation using "If-then-because" statements.

King and Kitchner (1993 cited in Mezirow, 1998) perceive of reflection as comprising three visions of knowledge and then classify these visions into three kinds of thinking pre-reflective thinking, quasi-reflective thinking and reflective thinking. Pre-reflective thinking is when a person perceives knowledge as coming from authority and therefore is certain of its correctness, quasi-reflective thinking is when a person starts to realize how matters are complicated and the uncertainty of knowledge and finds processing of problems difficult. Finally, reflective thinking is when a person assumes that knowledge is gained from different resources and its meaning comes from context.

Kember et al. (1999) relied on Mizrow's theory of adult learning (1991 cited in Cranton, 1994) in their classification of reflection. They distinguished between non-reflective actions and reflective actions. Non-reflective actions comprised habitual action, thoughtful action and introspection. Reflective action included content reflection where we reflect upon experiences or events or thoughts and feelings. Process reflection is where we examine how we perform our own thinking, feelings, and thinking (reminiscent of metacognition) and finally, premise reflection where we become aware of our reasons for thinking, feeling, and acting in certain ways which requires a critical review of our beliefs and suppositions.

Mostly qualitative methods have been used to investigate reflection. Journals, interviews and supervisory meetings were recorded and then studied for statements that indicate levels of reflectivity and emerging patterns of change into more sophisticated levels of thinking. Consequently, any one of the schemes reviewed above can be implemented for analyzing any of these sources of data and placing subjects at any one level of the scheme adopted. There is a problem however, when we attempt to use these schemes in investigating reflection during action research. This problem resides in the nature of action research as a highly structured venture. Unlike diaries, discussions and conferences, action research has well-identified processes of planning, acting and reviewing.

This mismatch between the existing schemes of analysis (designed for more naturalistic sources of data) and the nature of action research (a structured source of data) suggested the need for a different scheme of analysis. It was clear that reflective thinking in an activity as complex as action research is not confined to records of reactions/feelings and/or observations as it is the case with journal entries. It was envisioned that reflective thinking is an integral feature of the research process itself that starts with sensing the problem to planning a solution to implementing the plan to evaluating the plan and to finally thinking of other cycles of investigation. There was a need for a new scheme that allows the investigation of thinking during each of these processes.

## 5. Criteria for designing assessment tools of reflective thinking

Kember et al. (1999) identified four criteria that should be characterizing any given method used for assessing reflective thinking with student's written reflective journal. Although they specified the method to be used with students' written journals, the criteria they identified are relevant to use with other types of data, in our case, action research reports. First, the method should focus upon reflective thinking and it should assess it directly. Second, the assessment tool should not be imposed or external to the regular requirements of the course for authenticity and in order to avoid additional burden over the students. Third, the method should be specified in details so that others could use it and fourth, there should be appropriate testing for reliability. In this paper, these criteria were used

guiding the design of the inventory of students' reflective thinking via action research.

## 6. The inventory of reflective thinking via action research (IRTAR)

### 6.1. The theoretical basis for the inventory

Although the schemes of analyzing reflection discussed above appear different, they share essentially similar characterization of reflection. A synthesis of the conceptualization of reflection in these different schemes shows the following features. First, reflection exists at more than one level. Second, thinking at a low level of reflection involves technical, habitual, subjective, rigid thoughts, feelings, and/or views. Third, the higher a persons' reflective thinking develops the more he/she starts to realize the subjectivity of knowledge, the relativity of truth, the multiplicity of sources of knowledge and the importance of context in determining meaning. Fourth, the highest level of reflection involves questioning ones' own assumptions and beliefs, the impact of the societal and cultural values over educational practices, and the moral/ethical considerations behind these practices. Moreover, this high level of reflection involves the tendency to have visionary inclinations.

These features were considered essential in any assessment tool for reflective thinking. In other words, a tool should show multiplicity of levels, features of each level should embody the development from habitual rigid thinking to deep, multiple and larger contextual visionary thinking. These, in addition to the four criteria specified by Kember et al. (1999) were thus used as guiding principles in constructing the inventory.

### 6.2. Constructing the inventory of reflective thinking

First, the three stages of action research were identified as: *planning* which involves stating the problem and planning for action, *acting* which involves describing the steps taken to solve the problem, and *reviewing*, which involves examining the actions and their consequences, questioning the results, and envisioning future actions (Freeman, 1998; Gebhard, 1999). Then, the levels under each stage were specified. These were determined using two sources. The first was the literature review discussed above. The second was a review of a large database of action research reports by prospective

teachers submitted in fulfillment of course requirements in previous years. In each of these stages, reflective thinking was conceptualized as existing at four levels starting from *low* to *low-medium* and then moving up to *high-medium* and then *high.*

### 6.2.1. Planning

In this stage, a student considers a problem or a concern of his during practice. His/her thinking may be at a *low level* of reflection where he/she just states the problem without giving much thought to its causes, or at a *low-medium level*, where he/she may think in terms of single causal relationships. At a *high-medium level* of reflective thinking, a prospective teacher may consider the complexity of the problem thinking of multiple reasons causing it without considering larger contextual issues. At *the highest level* of thinking, he/she starts to view the problem from multiple perspectives considering larger societal, cultural and ethical reasons.

### 6.2.2. Plan of action

When planning for action, a student's thinking may be at a *low level* where he/she thinks only of procedures to follow without considering their rationale. Moving to a *low-medium level* of thinking, he/she may decide to investigate multiple actions without having a rationale for any or having single rationale for each action. At a *high-medium level* a student may want to investigate multiple actions having one single rationale for each. The *highest level* of reflective thinking in this stage is achieved when the student considers multiple courses of action giving multiple rationales for each.

### 6.2.3. Acting

When reporting actions taken, a *low level* of thinking is exhibited in avoiding giving detailed descriptions of actions. Moving to a *low-medium level* of thinking at this stage is exhibited when the student gives descriptions of his/her actions providing examples. At the *high-medium level* of thinking the student not only gives descriptions of actions but also shows awareness of the inadequacies and limitations of his/her work. At the *highest level* of thinking, the student describes what actually took place-showing awareness of both positive and negative consequences of these actions.

### 6.2.4. Reviewing

In the reviewing stage, the prospective teacher writes about himself/herself. (the "I") (Fund, Court,

& Kramarski, 2002, p. 487) in the research episode. It is the stage of the research where the student "makes a personal commitment in order to increase their involvement in and awareness of the processes that they undergo during their action research." (Fund et al., 2002, p. 490) In this final stage, reflective thinking may be at a *low level* where the prospective teacher is simply satisfied or dissatisfied with his/her own actions without giving reasons or giving simplistic ones (i.e. Students were pleased as a result of my action(s) or students continued to make noise in spite of my action(s)). He/she does not propose any further actions. At a *low-medium level*, he/she shows satisfaction/dissatisfaction with his/her actions giving reasons, drawing conclusions and proposing further actions. At a *high-medium level*, he/she shows satisfaction with his/her action but being aware of the limitations or inadequacies. This level is considered a higher level from the *low-medium level* because a student may be tempted to overlook limitations because of this self-satisfaction, yet he/she chooses to remain aware of the limitations and to propose further actions. At the *highest level*, a student shows satisfaction or dissatisfaction of actions giving reasons for his/her own evaluations of the situation. He/she further shows awareness of his beliefs and convictions and their limitations and/or relates these beliefs to other societal, cultural, or ethical issues where he/she contemplates further cycles of investigations and visions for the future (Appendix A).

### 6.3. Establishing validity of the inventory

The validity of the inventory was determined on the bases of a number of measures. First, the levels in each stage are the embodiment of levels of reflective thinking repeatedly emerging in the literature reviewed above. Second, to determine the content validity of the inventory, four experts (two professors and two associate professors of EFL and Curricula and Instruction) who are involved in teacher training and known for their commitment to the development of reflective thinking were asked to review the components of the inventory (Bateman & Griffin, 2003; Hatch & Lazaraton, 1991). They were requested to examine the correspondence of each component to the stages of action research and to determine how far the categories under each component comprehensively and accurately represent levels of reflective thinking. Their feedback led to further refinement of the items

under each stage and replacing some items with others such as "considering" instead of "contemplating."

The comments of the jury committee also resulted in rewriting the fourth scale to be more concise and inclusive of items that show more accurately reflection in the reviewing stage. For example, the fourth item in the fourth scale was not including awareness of larger societal, cultural and ethical issues, which is considered an essential constituent of high levels of reflective thinking. After carrying out the necessary modifications, the jury reported that the categories of the inventory were accurate and that the language was clear.

### 6.4. Establishing the reliability of the inventory

After establishing the validity of the inventory, the next step was examining its reliability. In order to determine inter-coder reliability of the inventory, 20 research reports out of the 100 reports investigated in this study were randomly selected. This was done because of the large amount of data and the difficulty of asking two raters other than the researcher to rate all 100 reports. The raters were academics from the same faculty. Each rater was given 20 scoring sheets. The scoring sheets included the reports analyzed into the three stages of planning, acting and reviewing and next to each stage its corresponding section of the inventory. This was done in order to facilitate the process of scoring for the raters. The raters scored the reports independently (Hatch & Lazaraton, 1991; Kerlinger, 1964). Cronbach $\alpha$ was computed as a measurement of the inter-coder reliability. The higher the value of Cronbach $\alpha$, the greater confidence we may have on the inventory of assessing reflective thinking. The value of $\alpha$ is a function of the level of agreement among raters. Murphy and Davidshofer (1991) suggested that an $\alpha$ of .70 is a typical value in estimating the reliability of rating scales. Values for the scales of problem statement, plan of action, acting and reviewing were .93, .81, .94, .83. These values all reach high levels indicating that the scales of the inventory are highly reliable.

### 7. Data analysis

#### 7.1. Units of analysis

The unit of analysis used in this study was a conceptual unit referred to as a "reflective unit."

(Bainer and Cantrell cited in Galves-Martin et al., 1998) A reflective unit is defined as "a single idea or thought about a particular topic or event." There is no specified length for this unit. All the action research reports were analyzed into reflective units under the headings: planning (statement of problem and plan of action), acting, and reviewing.

The planning stage was identified as all the units of thought a student mentioned about his/her problem. The problem statement is how he/she stated his research question. An example of a unit of thought in the problem statement is "I have a problem that is asking questions. The problem that after I explained my lesson to students, I wanted to know if they understand the lesson by asking some questions. I found questions are not enough or don't show what I want." The plan of action included all the steps that he/she has decided to take in order to approach the problem. Thus, the plan of action included reviewing literature in search for ideas or solutions, decisions as to what to do exactly and then steps of one choice or different alternative courses of action for solutions. One student wrote, "I have a read about the problem: the writer suggests some ways of asking questions (1) checking questions: imaging that you have just presented each of these words of phrases wide/narrow, belong to, inside/outside , write down one or two questions you could ask in class to check that students understood each item. (2) reading classroom questions, (3) eliciting long answers, I will use the first two steps." The acting stage includes all the descriptions of the actions he/she had taken in class in implementation of his/her plan (i.e., I gave students some questions about new vocabulary by giving opposites of the words to make students first know the new vocabulary to understand the text. Then I asked them to read questions in their book.). The reviewing stage includes the comments a student writes after the implementation of the plan. It includes all his/her observations, reactions and ideas/ feelings regarding what took place during the study and his/her suggestions for further cycles of research (i.e., I found students understand the lesson with little help from me. I decided to follow these steps after that with this problem.). (See Appendix B for a sample of action research reports).

#### 7.2. Scoring reflective units

Each unit of analysis was assigned a level of reflection specified in the scale in IRTAR. Each

student was given 4 scores on the four scales (statement of problem, plan of action, acting and reviewing) indicating *low, low-medium, high-medium* and *high* level of reflection. Each student was also given an average score indicating his/her overall level of reflection.

## 8. Results

In order to determine the level of reflection of the participants, it was decided that at least a ratio of (50% +) of the participants in the study should be at the *higher medium* or *high* level of reflection considering the fact they are at the end of their college studies and ready to go into the field.

At the stage of *planning* (stating the problem and making a plan of action) 86% of the participants were at the *low* or *low-medium* level of reflective thinking. At this level one prospective teacher wrote, "The problem I faced in my classroom is how to deal with individual differences, I went to the library to search for a book to solve my problem. After I read the book, I discovered that I must deal with the students carefully taking care to the individual differences and deal with every individual according to his level. At first, I was dealing with students as if they are in one level, after I read the book I discovered that I must try to raise the students' level." Only 14% were at the *high-medium* and *high* level of thinking showing a gap of 36% between this percentage of the sample and the minimum acceptable ratio of students determined previously (50% +) ($p < .01$) (Table 1). At this level, one participant wrote, "I teach in a commercial secondary school for girls. During teaching my class several times, I noticed that most of the learners can't pronounce some words correctly, in addition they can't spell words in a right way, they don't

know for example the silent letter in a word. I began to collect data and analyze it, I supposed that the incorrect pronunciation and spelling may be due to the students' low standard or may be due to the carelessness of English teachers, and I think that the most important reason is that there is not phonetics lab."

When *acting* on the basis of the plan, 73% of the participants were at the *low* or *low-medium* level of reflection (i.e. According to my possibilities I made the learners read aloud, then I correct the error, briefly I applied the first alternative and the last one). Twenty-seven percent were at the *high-medium* and *high* level showing a gap of 29% between 27% of the participants and the acceptable ratio determined previously (50% +). At this level, one student wrote, "I began to follow my plan step-by step to achieve the result that I want. But of course writing a plan is not like doing it. It is more difficult to do the action inside the class."

Finally, at the *reviewing* stage, 59% of the participants were at the *low* or *medium-low* level of reflection (i.e. I found students understand the lesson with little help from me. I decided to follow these steps after that with this problem.). Only 31% were at the *high-medium* or *high* level of reflection (i.e. When I gave them the two exercises which I mentioned above, I observed that they did the exercises very well and they gave me many new answers for the dialogue that match the situation. I observed also that their voice was not loud as in group work. This means that the classroom was semi calm while they are working together in pairs successfully. I observed also other teachers while their teaching they let their students to work in pairs and this was a successful way of the students' work. So I'm satisfied now with the group working in some exercises (not all) and the work in pairs in the

Table 1
Prospective teachers' scores compared to standardized ratio (50% +) using one sample *Z* test

| Stages of action research | Levels of reflective thinking | | | | | | | | One sample test with 50% + | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Low | | Low medium | | High medium | | High | | 95% CI | Gap (%) | *Z* | *p*-value |
| | *n* | % | *n* | % | *n* | % | *n* | % | | | | |
| Statement of problem | 67 | 67.0 | 19 | 19.0 | 12 | 12.0 | 2 | 2.0 | 0.06, 0.21 | 36 | −7.2 | 0.000 $p < 0.01$ |
| Plan of action | 30 | 30.0 | 43 | 43.0 | 21 | 21.0 | 6 | 6.0 | 0.13, 0.30 | 29 | −4.6 | 0.000 $p < 0.01$ |
| Acting | 39 | 39.0 | 48 | 48.0 | 11 | 11.0 | 2 | 2.0 | 0.07, 0.21 | 37 | −4.8 | 0.000 $p < 0.01$ |
| Reviewing | 30 | 30.0 | 29 | 29.0 | 29 | 29.0 | 2 | 2.0 | 0.22, 0.41 | 19 | −3.8 | 0.000 $p < 0.01$ |
| Overall | 30 | 30.0 | 65 | 65.0 | 4 | 4.0 | 1 | 1.0 | 0.02, 0.11 | 45 | −9.0 | 0.000 $p < 0.01$ |

rest of the exercises) showing a gap of 19% between this percentage of the sample and the minimum acceptable ratio determined previously (50%+) ($p < .01$) (Table 1).

At the overall level of reflection, 95% of the participants were at the *low* or *low-intermediate* level of reflection. Whereas only 5% of the sample were at the *high-medium* or *high* level of reflection showing a gap of 45% between this percentage of the sample and the minimum acceptable ratio determined previously (50%+) ($p < .01$) (Table 1).

## 9. Discussion

This study intended to determine the level of reflective thinking of prospective teachers of EFL. The finding that more than 50% of the prospective teachers participating in this study fell at either the *low* or *low-medium* level of reflection in all the stages of action research is rather alarming. *Low* and *low-medium* levels of reflection are the levels where one does not consider causes of problems or consider only single cause and effect reason for any given problem. At these levels a prospective teacher decides to either investigate a single action or multiple actions but has no rationale for any, does not describe the action or just gives examples of how he/she carried out the plan, and finally shows satisfaction or dissatisfaction with actions without giving reasons, or giving simplistic reasons. He/she may show satisfaction or dissatisfaction with their actions giving reasons, drawing conclusions and proposing further actions without moving to higher levels of reflection where he/she shows awareness of the possible limitations of their actions, their own beliefs and larger societal, cultural or ethical issues bearing on the problem and the action taken.

These results suggest that prospective teachers in Egypt may be unaware of the multiple reasons for problems, nor their motives for performing certain actions and not others. They may also be unaware of the consequences of their choices of actions. Moreover, they seem to lack vision and broader perspective of their work as prospective educators.

These results may be due to inadequacies in the training program. One is compelled to question the value of the large number of courses students are required to take on educational psychology, cognitive psychology, foundations of education, history of education, and school administration. Apparently, prospective teachers may be perceiving these courses as individual identities that have no connection and consequently they do not attempt to integrate ideas from these courses into their repertoire of thinking. For example, in no case there was any attempt to consider causes of problems from larger societal, cultural or ethical perspectives that are often present in their educational foundation and school administration courses.

Moreover, the present focus on methods of teaching, and the preoccupation with teaching strategies and techniques, leaves little time to developing reflective thinking. Further more, the current status of methodology courses sends messages to the trainees as to the primacy of acquiring a body of knowledge over acquiring and exhibiting reflective thinking capabilities. Whereas acquiring professional knowledge is a major goal for teacher preparation programs, it should not remain the only goal.

The fact that a 5-year reform project for the Faculties of Education (FOER) in Egypt is about to be launched in September, 2004 and funded by the USAID testifies to the inadequacy of current status of the teacher preparation programs. It, however, remains to be seen how reflective thinking will be developed within this project.

It is suggested here that well-established methodology courses may be supplemented with enrichment courses where main topics of controversial nature are extracted and used as springboards for further activities that aim at developing student teachers' thinking. Strategies frequently mentioned in the literature such as journal writing, reflection teams, role-playing, debates, and action research may be incorporated into the workings of current courses. This would necessarily require a decrease in the quantity of material covered. Finally, just as the evaluation system manipulates prospective teachers into the adoption of the teacher–technician stand, it can easily be used to encourage and reward them on adopting a teacher–researcher, thinker, reflector and visionary stand. This is done by giving value to assignments that require thinking, reflecting, examining presuppositions/beliefs and integrating ideas from other courses and fields in the same way value is given to assignments that require mastery of course content.

## 10. Limitations of the study

This study is exploratory in nature. It presents an attempt to construct a tool that assesses reflective

thinking as expressed in the participants' written reports of their action research. Still, the results need to be supplemented with research that investigates prospective teachers' reflective thinking in activities other than action research using other tools.

Further investigation should be conducted for possible variables that might have interfered with the scoring of the reports using the inventory. A follow up study should be conducted in order to investigate and control the effects of these variables and increase the validity of the tool. One possible intervening variable that may have confounded the results of the study is the participants' limited proficiency in English. Students' limited proficiency or their perceptions of their proficiency may have constrained their ability to express and elaborate on their ideas, feelings and reactions. Further investigation of students' reflection of action research could be done via interviews, think aloud protocols or any other form of data collection where students can have more room for expressing themselves orally and perhaps in their native language.

Another plausible explanation for the results is perhaps students' being less serious about this assignment knowing that it caries limited weight as far as their overall course grade is concerned, again giving primacy to the calls made above for further reconsidering of the components of EFL teacher training programs and how much attention should be given to prospective teachers' thinking as opposed to their content knowledge.

## 11. Further implications

This research resulted in an instrument for measuring the extent to which prospective teachers engage in reflective thinking while doing action research. Whereas the sample for this study was prospective teachers of EFL, the wording of the items is free from terminology specific to a particular discipline. Thus, the tool may be useful for measurement of reflective thinking of prospective teachers in other disciplines.

The IRTAR can be used as a guide for training programs aiming at developing action research skills. Prospective teachers can be guided through each stage by probing, questioning and discussion in order to move from one level to a higher one where

the highest levels in each stage function as major course objectives.

The instrument can also serve as a diagnostic tool at the beginning and at the end of teacher preparation programs using action research in order to assess the effectiveness of these programs in developing reflective thinking.

Each scale of the inventory may be used independently during supervisory meetings where prospective teachers, their colleagues and their supervisors discuss classroom events and actions, rationales for actions and their consequences. Through all these discussions alternative explanations, actions and interpretations of consequences are generated and evaluated. Another use for IRTAR would be examining the relationship between the scores on the scales with scores on other scales/observation sheets measuring other constructs related to teaching and learning such as teaching efficacy, teaching performance, teaching style and personality traits.

The crucial conclusion, however, from the findings of this study is that reflective thinking does not take care of itself. It does not seem to develop on its own or even develop with experience. Exposing prospective teachers to more teaching practice in schools or simply requiring them to conduct action research may pressure them to go through the motions but may not motivate them nor help them become more reflective. Prospective teachers can easily manage to stick to the format of research reports, pay attention to the superficial features of doing a piece of research but fail to ponder their actions and their consequences. Scaffolding and mentoring are required in order to develop prospective teachers' reflective abilities given the rather complicated and difficult nature of this process (Moon, 1999).

Since this study investigated prospective teachers' thinking, given their lack of experience, a follow up study investigating in-service teachers with differential years of experience may help in drawing a more comprehensive profile of the teachers of this nation. This profile is needed in order to guide initiatives of professional development and in-service training within the upcoming reform projects of teacher training programs in Egypt.

Empirical research is needed to investigate the effects of the proposed enrichment courses, reflectivity-promotional activities and thinking-oriented evaluation systems over the development of reflective thinking.

**Appendix A. The Inventory of Reflective Thinking via Action Research (IRTAR)**

| | | |
|---|---|---|
| Planning | | |
| *Problem statement* | 0 | Describes the problem without considering its possible reasons. |
| | 1 | Describes the problem giving a single cause and effect reason (e.g. They misbehave because they hate school). |
| | 2 | Describes the problem considering possible multiple reasons. |
| | 3 | Describes the problem considering multiple reasons including larger societal, ethical or cultural reasons. |
| *Plan of action* | 0 | Decides to take an action at a procedural level without further consideration of the action, its reasons/rationale. |
| | 1 | Decides to investigate multiple actions without giving a rationale for any. |
| | 2 | Decides to investigate multiple actions giving a single reason or rationale for each action. |
| | 3 | Decides to investigate multiple actions giving multiple reasons or rationales for each relating them to other theories/readings. |
| Acting | 0 | Gives no report of procedures followed and how he actually conducted the plan. (e.g. I followed the plan). |
| | 1 | Describes the actions he took giving specific examples of how he carried out the plan. |
| | 2 | Describes the actions showing an awareness of the inadequacies, complexities and limitations of his work. |
| | 3 | Describes the actions showing awareness of the possible negative and positive consequences of them. (Punishing students might keep them quiet but it may not make them learn). |
| Reviewing | 0 | Showing satisfaction/dissatisfaction with action(s) taken without giving reasons/or giving simple reason(s) and proposing no further actions. |
| | 1 | Showing satisfaction/dissatisfaction with action(s) taken giving reasons, drawing conclusions and proposing further action(s). |
| | 2 | Showing satisfaction with actions giving reasons but expressing awareness of limitations of action and proposing further action. |
| | 3 | Showing satisfaction/dissatisfaction with actions giving reasons and showing awareness of ones' own beliefs and their possible limitations relating them to other societal, cultural or ethical issues and proposing further actions or visions. |

**Appendix B**

The problem I faced in my classroom is how to deal with individual differences, so I went to the library and searched for a book to solve my problem. After I read the book, I discovered that I must deal with the students carefully taking care to the individual differences and deal with every individual according to his level. At first I was dealing with the students as if they are in one level. After I read the book, I discovered that I must try to raise the students' level.

The students who are in low level I made tests for them and I asked them to read more and more for example the student who can't answer the reading comprehension I asked them to do more exercises.

After three or four attempts the students became more positive and I discovered that doing more exercises for them was more effective for them.

After I discovered the importance of exercises for them I tried to find interesting exercises for them. I made an exam for them and I discovered that I made progress with them.

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