

International Journal of Education Sciences (IJES)

Received on 18. 12. 2013/23. 09. 2014

REF. NO. IJES-524

(Always refer our Reference No. for all correspondence)

Recovering the Concept of Teaching

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ABBREVIATED TITLE: RECOVERING TEACHING CONCEPT

KEYWORDS mastery learning; outcomes based education; progressive/traditional approaches.

ABSTRACT In 1998 outcomes based education was introduced into South African education. At the same time traditional education was replaced with progressive education which meant that formal tuition and direct instruction were replaced with facilitative programmes of self-discovery learning. This article is a defence of the concept of purposive, instructive teaching. The article proceeds firstly with explanation of the differences between the concepts of progressive and traditional teaching approaches. Following thereon is an exposition of a teaching strategy, namely Bloom's mastery learning strategy, which is outcome directed and amenable not only to progressive, facilitative teaching but also to traditional, instructive teaching. This article includes lastly a discussion of the findings of process-product research, reported in literature, which compared the effectiveness of facilitative teaching and instructive teaching.

INTRODUCTION

In 1998 South African education changed officially to outcomes based education (OBE). The change, called Curriculum 2005, involved a radical shift away from traditional, teacher- and content-centred education. Minimal content was prescribed and formal tuition and direct

instruction were replaced with progressive, facilitative programmes of self-discovery learning. The aim with Curriculum 2005 was “the full personal development of each learner” and to thus benefit “social and economic development” (RSA 1997:10).

Since the introduction of Curriculum 2005, and during these past years discontent with the academic achievement of school learners was voiced, and is still being voiced (Kadalie 2013:20). Poor academic performance is especially prominent in the historically disadvantaged communities. Since the introduction of Curriculum 2005 the curriculum has been revised twice. The first revision occurred already in 2001. Teachers as “mediators of learning” rather than instructors remained (RSA 2002b:9), but more guidance as to the subject content of each learning area was given in the form of assessment standards (RSA 2002a). This revision did not, however, decrease the gap between education hopes and actual academic achievement. In 2005 the disappointing academic achievement of South Africa’s learners was again officially addressed. The outcome was that the Ministerial Committee on Teacher Education (RSA 2005:6) recommended that schools should “retrieve the word ‘teaching’, and understand it as the practice of organising systematic learning.” Subsequently in 2009 the then newly appointed Minister of Basic Education, Ms Angie Motshekga, announced that further, and more, drastic changes to the national curriculum would be made and she also called for teachers to be given more time to engage in teaching (Beeld 2009:7). She further announced that an outcomes based framework would not be done away with because she contended that its basic principles were good (Beeld 2009:7). In 2010, Ms Motshekga appointed a task team to revise the national curriculum, and these are being implemented as the Curriculum and Assessment Policy Statement (CAPS) since 2012, starting with the foundation phase.

It is as yet too early to assess the success of these latest changes. However, because of the fact that Ms Motshekga retained OBE, but called for a return to teaching, this article addresses the problem of recovering and returning to the concept of teaching. This is a problem that needs addressing because, as Muijs and Reynolds (2002:vii) point out, the evidence that has been generated in the school effectiveness research community shows that teaching practices are more important than other factors in determining learners’ academic performance.

The purpose and aim of this article is to defend the concept of purposive, instructive teaching, the reason being that since the early 1960s data has accumulated showing that students who receive high quality direct instruction demonstrate more successful school learning than students

who do not (Joyce et al. 2003). Thus, this article reflects on research reported in literature that compared the effectiveness of facilitative teaching and instructive teaching. The reason for a literature study is that it gave this author a wide empirical field of research on which to reflect. The relevant research was large-sample research that was conducted by various experienced researchers. It covered different school learning areas and was stretched over a sufficiently long time to give reliable results. Such research, reported in academic-scientific literature, provided the necessary supporting evidence for argumentation.

The departure point in the literature study was a search for a teaching strategy that was outcome directed and amenable not only to facilitative teaching – the teaching approach initially introduced with OBE in South Africa – but also to instructive teaching. The reason for this departure point was the fact that Ms Motshekga announced that the concept and principles of OBE were to be retained (Beeld 2009:7). A strategy which is outcome directed and amenable to both facilitative and instructive teaching is *mastery learning* (ML). A discussion of ML, prior to a discussion of the research findings reported in the literature studied, is therefore included in this article. However, it is first necessary to explain the differences between instructive and facilitative teaching

THE TWO CATEGORIES OF TEACHING APPROACHES

Teaching approaches can be classified into two categories, on the one hand, the traditional, instructivist approach and, on the other hand, the progressive, facilitative approach. The traditional approach shall be discussed first.

Traditional education

The traditional approach to teaching is a structured, instructivist approach. Its foundational premise is that cognitive abilities can be classified into two categories, namely, primary and secondary abilities. The primary cognitive abilities are speech, a basic number-sense and psychomotor skills. These abilities develop naturally in normal children in normal circumstances. The secondary cognitive abilities are the three R's and all further intellectual learning, and these “do not develop unless they are taught” (Hirsch 1996:88). On the basis of this premise, the best approach to teaching is direct and purposeful instruction.

Traditional educationists maintain that the belief that the emergence and development of the secondary cognitive abilities depend on instruction is not an unsupported assumption, but “a self-evident inference from their non-universality across cultures” (Hirsch 1996:88). Traditional educationists maintain that the fact that illiterate cultures have existed in the past and that illiteracy has existed and still exists in literate cultures is indisputable evidence for inferring that the three R’s are not biological processes that develop naturally but, instead, are artificial constructs that should be explicitly taught in order to be maximally learnt and developed (Fletcher and Lyon 1998:56; Hirsch 1996:88; Stone and Clements 1998:17). In other words, traditional educationists maintain that their premise is not *a priori* speculation, but corresponds to the reality of how the secondary cognitive abilities are acquired and developed, namely, through deliberate instruction and extensive practice, including drilling of basic concepts and skills to secure the learning.

Progressive education

The progressive approach to teaching is an unstructured, facilitative approach, the so-called learner-centred approach, and it was implemented together with Curriculum 2005. Two foundational premises of progressive education can be identified. The first is the belief that the development of *all* cognitive, intellectual development, like physical development, is a natural process that occurs in a definite sequence which, although age-related, may proceed faster or slower in individual children (Horn 2010a:3). The second foundational premise that can be identified in progressive education is the assumption that “students need to learn not a body of knowledge but ‘how to’ skills that (supposedly) enable them to pick up specific knowledge later on” (Hirsch 2012:1).

On the basis of their first premise, progressive educationists maintain that the best education is not instructive, but instead facilitates the development of each child’s cognitive abilities in a natural way (Stone 1996; Egan 2004). On the basis of their second premise, progressive educationists do not emphasise the instruction of specific bodies of knowledge but, rather, self-discovery, that is, the discovery and construction of knowledge by the learners themselves. Thus, progressive educationists believe that the best approach to teaching is the creation of situations that stimulate natural learning in harmony with its (supposed) natural development. It follows therefore that progressive education is centred not on the teacher and the

content taught but on the learner, hence the term learner-centredness. The centrality of the learner means that formal instruction is replaced with programmes of experiential self-discovery during which the teacher acts merely as facilitator of learning. The teacher is, as Hirsch (2001:4) puts it, “a watchful guide on the side, not a sage on the stage.”

According to progressive educationists, the best teaching method is learner-exploration in a classroom that encourages/facilitates incidental, natural learning. Part and parcel of such teaching are whole-language (incidental, natural learning of reading); hands-on activities so that learners construct their own meaning of the learning material; multi-disciplinary, life-like projects involving independent research and self-discovery; mixed-ability group work where learners together take responsibility for their learning; and authentic assessment that focusses more on the process than on the product of learning (Horn 2009:515-516).

Although the progressive approach to teaching was implemented together with Curriculum 2005, it is not essential to an outcomes based education approach, as is illustrated in *mastery learning* (ML). ML serves as an example of an outcomes based approach that is amenable to both progressive, facilitative teaching and to traditional, instructive teaching.

MASTERY LEARNING

Before proceeding with the discussion of ML, the link between OBE and ML shall be briefly stated. OBE and ML are conceptually and theoretically linked, one reason being that both OBE and ML are founded on the belief that all children can learn. A second reason is that both ML and OBE specify preset outcomes. However, OBE is a curriculum reform model that specifies broad, generic, cross-curricular outcomes as well as broad, cross-grade outcomes for each learning area. In contrast, ML is a classroom strategy and requires teachers to set not only the envisaged broad, cross-grade outcomes, but requires teachers to also set precise outcomes for each lesson or set of lessons (Guskey 1994).

All teachers aim at effecting learning success, and in the 1920s attempts were made to devise a formal classroom strategy that would hopefully ensure that all learners mastered the learning content. In 1922 Carleton Washburne and his colleagues drew up a mastery learning strategy, which they called the *Winnetka Plan*, and in 1926 Prof Henry C Morrison implemented a mastery learning strategy at the Laboratory School of the University of Chicago (Bloom 1976:4).

Interest in and application of Washburne's and Morrison's mastery learning strategies never became widespread. However, in the late 1950s and early 1960s, there was renewed interest in formal mastery learning strategies, in particular the strategy devised by Benjamin Bloom and dubbed *mastery learning* (ML) (Bloom, 1974; 1976).

In brief, Bloom's mastery learning (ML) strategy involved the following:

- Mastery of learning content is assessed in terms of goals (that is, outcomes) which all learners must achieve. The envisaged outcomes are explicitly formulated prior to teaching and hierarchically sequenced in order to act as benchmarks.
- The learning content is structured into hierarchical learning units.
- Every learning unit must be mastered before the learner can progress to the following unit.
- There is frequent criterion-referenced assessment of learning which serves as formative assessment.
- Learning is assessed at the end of a unit and such assessment serves as summative assessment.
- Additional time (for re-teaching/re-learning) is provided to learners who at the time of assessment have not achieved the performance standard of the relevant learning task. (Block 1971; Bloom 1976.)

Bloom (1974:687; 1976: 30ff) recognised that there are three variables which affect an individual learner's mastery of learning content, namely, the cognitive entry behaviour (CEB), the affective entry characteristic (AEC) and the quality of instruction. The CEB includes the learner's prior knowledge (subject specific and general knowledge) as well as his/her reading comprehension, ability to concentrate, intelligence and cognitive abilities and skills whilst the AEC is the learner's level of motivation for the learning task. The quality of instruction is determined by the measure in which the presentation, the explanations and structuring of learning content and/or tasks suits the learner's particular learning needs. Quality instruction requires that appropriate teaching practices are used by the teacher, the active involvement of each learner, reinforcement of learning via praise and reward, learning support which can include peer tutoring, and giving each learner sufficient time to learn and/or execute a task.

The CEB and AEC of a particular learner determine the time he/she needs to understand the material being instructed. In this regard, Bloom echoed John Carroll (Bloom 1974:683) that “the ‘quality of instruction and the student’s ability to understand the instruction’ would when both were optimal make the time needed minimal for each student.” In individual teaching the ideal of minimal time can be achieved, and thus Bloom attempted to design a strategy which would move group teaching closer to the ideal of individual teaching. His approach was to “improve traditional classroom instruction by examining what it was about individual tutoring that made it an effective instructional approach” (Mikechanguh 2007:1). His ideal was a classroom situation where each individual learner has the opportunity to master the learning content, and he assumed that every individual could attain mastery if the correct teaching method was used and sufficient time was given so that learners could proceed at their own pace and in accordance with their own abilities (Bloom 1974; 1976). He advocated preset outcomes because they provide the teacher with a framework for designing and delivering the content which he/she must teach and which the learners must learn. Furthermore, the extent to which the outcomes have been achieved enables the teacher to assess his/her own teaching effectiveness.

Bloom’s underlying premise was that all children can learn and achieve appropriate learning outcomes if the correct teaching method is used. From this premise, it follows that the ultimate deciding factor in learning mastery is the quality of teaching. Bloom did not prescribe an actual teaching method and his strategy is open to be interpreted in terms of either one of the two teaching approaches, namely, progressive, facilitative teaching or traditional, instructive teaching.. In the next section ML with teaching interpreted as direct, purposeful instruction shall be discussed.

MASTERY LEARNING WITH THE INCLUSION OF INSTRUCTIVE TEACHING

In the 1960s Siegfried Engelmann designed a ML strategy which prescribed direct and purposeful instruction as teaching method, and which he appropriately called *Direct Instruction* (DI). Engelmann’s premise was: ‘If a student hasn’t learnt, the teacher hasn’t taught’ (Lindsay 2004:3; Marchand-Martella et al. 2005:2). Thus, Engelmann believed, as did Bloom, that all children can learn and achieve reasonable academic outcomes if an effective teaching method is used.

Engelmann's DI structure has the same instructional design as that of Bloom's ML (see previous section). It also begins with the formulation of clear outcomes/objectives and standards of achievement, divides the learning content into small, hierarchical units and includes frequent assessment and re-teaching if and when necessary. To this structure Engelmann added that the children should be homogenously grouped in accordance with their level of skill in the learning area being taught (Burden and Boyd 2007:117ff).

Engelmann's DI strategy, and all DI strategies designed subsequent to his, involve a consistent practice of explicit, interactive teaching: teacher explains, frequently asks questions, checks understanding (learners are not passive observers), guides learners' practice and gives constant assessment and feedback (Carnine et al. 1990:25; Project Follow-Through 2006:1-2). Lindsay (2010:1) describes DI as "rich in structure and drilling and content ... [and] the opposite of the favoured methods of today's ... education gurus, and contradicts the popular theories that are taught today."

Engelmann used his direct teaching strategy with consistent success "to help inner-city children learn and excel" (Lindsay 2004:1). Such success is in itself evidence of the effectiveness of direct, purposive instruction. In the next section, some further examples of empirical evidence regarding the effectiveness of direct, purposive instruction shall be presented.

RESEARCH COMPARING INSTRUCTIVE AND FACILITATIVE TEACHING

The research reported below was empirical field or more specifically, "process-product" research (when a teacher does this – the process – it results in this sort of learner achievement – the product). Learning is seen as a product in traditional forms of education (Macdonald and Pinheiro 2012:90). The research covered different school learning areas and was conducted by a wide range of experienced researchers who all used samples large enough to give reliable results. The first research to be reported is concerned with the teaching of reading.

Teaching reading

Reading is a prerequisite for well-nigh everything in school and in the whole of modern life itself. Therefore, teaching children to read is a most important outcome of modern academic education, and it needs to be mastered at an early age.

In the field of teaching reading, the instructive method is systematic phonics and phoneme awareness: children are taught to read by first learning the speech sounds of letters, how letters blend into syllables, and how those syllables make up words. Children are taught how to sound out and blend the letters that make up words, from the simple to the complex (Davies and van Staden 2005:104-105). In this way, they realise that the alphabet is a code representing a great variety of sounds, and moreover, they learn the logic of the spelling system of that language. Once a child has mastered the mechanics, the decoding of words becomes automatic and his/her conscious attention can be focussed on the meaning of the reading material. Decoding is the lower skill and comprehension the higher skill. Automatic decoding is, however, essential because if it is “not automatised, there is inadequate attentional capacity for higher order comprehension skills” (Pretorius 2012:91).

The progressive method of teaching reading, is whole language – also known as the look and say, psycholinguistics, reading recovery, balanced literacy, or integrated reading instruction (Sweet 1996) – which require children to guess words in context by using initial letters and/or picture clues. As Kenneth Goodman, fore-most proponent of whole language, says, the children are engaged in “psycholinguistic guessing games” (cited in Sweet 1996). Using the whole language to teach reading actually requires children to memorise a word in the manner used to read pictographic languages. In regard to the memorisation of a word, Sweet (1996) points out: “Reading failure usually shows after the fourth grade, where the volume of words, needed for reading difficult material, in sciences, literature, history, or mathematics, cannot be memorized quick enough.”

Empirical research, covering the field of teaching reading, tends to affirm that phonics rather than the whole language method of teaching, achieves better results. Research examples thereof are Adams(1990), Brown and Felton (1990), Chall (1967 and 1983), Engelmann (1992), Foorman (1994), Groff (1994), Paulu (1988), and Shears and Keogh (1993) (cited in Horn 2009:518). The studies of psychologist Sally Shaywitz (cited in Vare 2006) agreed with these researchers’ findings. Her studies showed “a person’s ability to read depends on *learned* [my emphasis] phonemic awareness and processing of printed letters on pages, capacities that are only haphazardly developed in the Whole Language method, but explicitly taught in Phonics” (Vare 2006:1). Further evidence is supplied by Bill Honig (cited in Horn 2009:518). Honig questioned more than ten thousand teachers, and all these teachers agreed that reading-disabled

children exhibited poor phonic decoding skills, and that poor readers had problems with vocabulary, spelling, understanding, motivation and confidence, all of which issued forth from their reading problems.

A concerning reading problem is dyslexia. Wimmer (1993), Goswami and Wimmer (1994), Landerl, Wimmer and Frith (1997) and Geva and Siegel (undated) carried out empirical, comparative research of the rate of occurrence of dyslexia in various countries. All of these researchers found that the most predominant occurrence of dyslexia was in English-speaking countries. Prof Diane McGuinness, a leading cognitive psychologist (cited in Dyslexics.org.uk 1997), maintains that this finding suggests that dyslexia is not always an inborn neurological disorder, but, instead, can issue forth from the whole language method which does not explicitly teach the decoding skill that is necessary to connect the sounds to written the letters of an alphabetic language. Whole-language has for many years been a popular method used to teach reading in English-speaking countries.

Teaching mathematics

An example of a study in mathematics teaching that compared instructive teaching and the facilitative approach (also called the constructivist approach) is that of Crawford and Snider (cited in DeRosa 2007). Fourth grade learners were randomly assigned to two teachers, one of whom had to use the facilitative, constructivist approach, an approach he had been using for eleven years, and the other had to use Engelmann's DI strategy, that is, ML adapted to include direct instructive teaching. The latter teacher had fourteen years teaching experience, but no experience in DI. She was given four hour workshop training and three hours training from the experimenters. The learners were heterogeneous and none had previously been taught via instructive teaching. The learners were pretested and no significant differences between the two groups showed up.

Both teachers taught their group a programme that covered addition and subtraction of multi-digit numbers, multiplication, division, fractions and problem solving with whole numbers. The experimenters, Crawford and Snider, designed two tests that were designed to be comprehensive as well as cumulative. One was biased in favour of the learners taught via DI and the other test in

favour of the learners taught via the facilitative, constructivist approach. Both groups wrote both these tests as well as a rapid recall test of multiplication facts.

On all the tests, the group of learners taught via DI fared significantly better, and, furthermore, the experimenters Crawford and Snider found that the high-performing learners liked the highly structured DI program more. Crawford and Snider (quoted by DeRosa 2007:4-5) remarked on the latter finding as follows:

It may be somewhat counter-intuitive that an explicit, structured program would be well-received by more able students. We often assume that more capable students benefit most from a less structured approach that gives them the freedom to discover and explore, whereas more didactic approaches ought to be reserved for low-performing students. It could be that high-performing students do well and respond well to highly-structured approaches when they are sufficiently challenging. These reports are interesting enough to bear further investigation.

A possible explanation of the fact that the high performers liked structured teaching more is that the structure actually prevents boredom by enabling them to move sooner to the next step in their eager intellectual enquiry. In fact, one of the best instructive techniques, especially for high performers, is the Socratic method that enables learners to discover and construct knowledge on their own by leading them from stage to stage with carefully framed and very precise questions (Bantock 1981:63).

Special needs education

Watkins and Slocum (quoted in Marchand-Martella et al. 2005:3) maintain that: “More than any other ... instructional programs, Direct Instruction is supported by research.” This strong claim is supported by independent reviews of research that focussed in particular on learners with special needs, for example, White in 1988, Adams and Engelmann in 1996 and Forness, Kavale, Blum and Lloyd in 1997 (cited in Marchand-Martella et al. 2005:3.). Thus, instructive teaching promotes not only success for able students, but also promotes success for learners with special needs. As Marchand-Martella et al. (2005:4) point out: “By their very nature, DI programs meet the needs of students who struggle academically.”

James Coleman's studies of Roman Catholic private schools in America

The sociologist James Coleman sought reasons for the high academic achievement of learners from disadvantaged homes at Roman Catholic private schools in America. Hirsch (cited in Horn 2009:522) sketches Coleman's findings as follows:

Catholic schools achieve more educational equity than public schools because they follow a rich and demanding curriculum; provide a structured, orderly environment; offer lots of explicit instruction, including drill and practice; and expect every child to reach minimal goals in each subject by the end of the year. All of this stands in stark contrast to the progressive ideals of unstructured, implicit teaching and "individually tailored" instruction that now predominate in public schools. As a result, disadvantaged children prosper academically and the schools narrow the gaps among races and social classes. When criticized for condemning public schools, Coleman pointed out that the very same democratic results were being achieved by the few public schools that were also defying progressivist doctrine.

Project Follow-Through

Project Follow-Through (2006) was the world's largest and most long-term educational experiment. It began in 1967 and received its last state grant in 1995. It tested the effectiveness of teaching methods in the early grades, and its purpose was to identify the best teaching method which could then be used to teach academically at-risk learners. It involved more than 70 000 children a year in more than 180 schools. Nine teaching methods were tested, and each of these fell into one of three types – (1) a structured and teacher-directed approach; (2) an approach that emphasises learners' self-discovery and construction of knowledge; and (3) a whole-child approach that aims at boosting self-esteem in order to boost achievement. The outcomes assessed were in three areas, namely, basics such as spelling and computation; academic skills such as problem-solving and cognition skills; and learners' sense of self-concept. The test scores of the learners at each Follow-Through school were compared with the other Follow-Through schools and with non-Follow-Through schools. Two agencies that were independent from American education authorities and institutions carried out the analytical comparisons.

The findings were unequivocal: *in all three areas, learners taught by highly structured, teacher-directed methods came out on top.* The one teaching strategy that consistently gave the best results was Engelmann's DI, that is, the ML strategy with instructive teaching and not facilitative

teaching. (Carnine et al. 1990:23-24; Cooms 1998; Grossen 1998:26ff; Horn 2009:521; Lindsay 2004:1-2; Moeller 1994:36-37.)

David Klahr's studies of facilitative, self-discovery learning

David Klahr, a psychology professor at Carnegie Mellon University, conducted years of empirical research that compared instructive and facilitative, self-discovery learning. For example, in one experiment Klahr (cited in Adelson 2004:36-37) randomly assigned 112 learners in grades 3 and 4 to a hands-on, experimental activity that proceeded via either a constructivist, self-discovery approach or a direct instruction approach. He found that after direct instructive teaching, where the teacher structured and explicitly guided and led the learners during the experiment, 77% of the learners students could transfer the experimental strategy to something new and were able to critically evaluate flawed experiments. After self-discovery only 23% were able to do the same. As Adelson (2004:35-36) says, Klahr's research clearly shows that: "Discovery learning's purported advantage was not supported." In fact, his findings after years of such research was that "discovery learning can include mixed or missing feedback, encoding errors, causal misattributions and more, which could actually cause frustration and set a learner back" (cited in Adelson 2004:35).

It is true that children are innately curious and enjoy exploring. Thus, hands-on, discovery learning certainly has an important place in education, especially in practical learning areas such as the natural sciences. However, without structured teacher guidance, children's investigations are unsystematic and thus their discoveries are haphazard and, as Hirsch (1996:250) says, they may even "make discoveries that aren't true." Over thirty years ago, but still valid today, Bantock (1981:57) pointed out that for discovery learning to be effective, the learner must have at his/her "disposal a set of mental tools which enables him[/her] to order the bewildering mass of impressions . . . in some meaningful way." In other words, for meaningful discovery learning, the teacher must structure the activity, prepare the learners for the activity and focus their attention on the relevant things. Furthermore, learners do not come to the classroom with empty minds, and if they have incorrect ideas about the issue being investigated they will almost certainly not construct real knowledge but an incorrect conceptual framework (Horn 2010b:101-102).

Discovery learning can also proceed via extra-mural projects, but projects should never replace classroom teaching. Their purpose is to clarify, extend and/or apply the concepts taught in the classroom. Much background knowledge explained by the teacher beforehand is necessary for school learners to carry out a project successfully (Horn 2010b:105).

CONCLUSION

This article concludes the strategy of ML and OBE of pre-setting envisaged outcomes makes educational sense. A combination of these strategies is the way forward to recover the concept of quality teaching in our country. As Gardner (1999:72) says: “I do not think it is possible to talk intelligibly about how to teach unless one has taken a stand on what one should teach and why.” Knowing what to teach and why it is taught are important prior to teaching. However, the effectiveness of teaching – the extent to which the learners meet expectations – depends on how the learning content is taught, and empirical evidence tends to point to well-structured, direct and purposive teaching as the most successful method for effecting successful learning.

ACKNOWLEDGEMENT

To Irmhild Horn, retired professor in Education at Unisa, due acknowledgement is hereby made and my gratitude is hereby expressed for all her help and guidance in the writing of this article.

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