An integrated and holistic approach to assessment

in outcome-based learning in South Africa
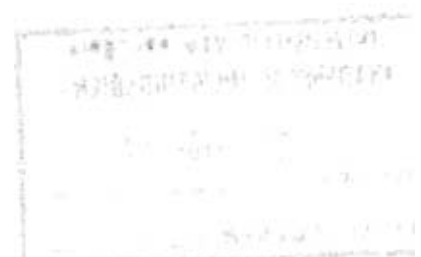
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Submitted in partial fulfilment for the requirements for the degree

Philosophiae Doctor (Computer-assisted Education)

in the

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An integrated and holistic approach to assessment in outcome-based learning[1] in South Africa

A PhD thesis by Annette de Jager

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Degree	Philosophiae Doctor (Computer-assisted Education)

Bloom (1956) states that learning is the permanent change in the cognitive, affective and psychomotor domains of a learner. Considering that learners have different learning styles and educators have different teaching methodologies, the question that I have been paying special attention to since I started teaching is: "How do I know that learning has really taken place?"

The only way to determine if learning has taken place, i.e. whether there is a permanent change in the cognitive, affective and psychomotor domains of the learner, is to measure the learning. The conventional measuring tools in a content-based education system are tests and examinations. This approach often results in a tendency towards awarding learners with a once-off qualification and not necessarily providing them with the academic and life skills needed to enter the workplace. Although outcome-based education creates the opportunity to change the product-driven and rote learning measuring in content-based education to the process-driven and authentic assessment of learning in outcome-based education, the question of whether learning has really taken place still exists. The focus of this study is therefore the assessment of learning in outcome-based education to confirm that learning has really taken place.

This study comprises of action research of six cycles of one year each (1997 - 2002) and pertains to changing the Further Diploma in Education (Computer-assisted Education) qualification as presented by the University of Pretoria, from a content-based (1997 – 1998) into an outcome-based education approach (1999 – 2002). What initially seemed to be an easy task in 1999, turned out to be a complex challenge to discover all the aspects contributing to the successful implementation of outcome-based assessment of learning South African education, training and development.

The findings of the study indicate that is not possible simply to convert evaluation in content-based learning into assessment in outcome-based learning. Outcome-based learning is a totally different way of doing and it takes time to make an internal mind-change as well as a change that can be observed externally. It also reveals that it is not possible to eliminate content-based learning in favour of outcome-based learning. There is a place for both and both are imperative to the needs of learners.

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[1] The context of "outcome-based learning" is in the conceptualisation of the idea and not in the numeric value of a number of outcomes as "outcomes-based learning" may be interpreted [Chapter3, Chapter 8].

The complex problem of assessment in outcome-based learning has no straightforward solution. It can only be stated that if all aspects are considered, there is a fair chance to end up with a permanent change in the cognitive, affective and psychomotor skills of a person, i.e. that learning has taken place. There is a real need for information on the following aspects to be considered in an integrated and holistic approach to assessment of learning in outcome-based education:

> The governmental policy and current educational philosophy
> The design, development and implementation of the learning programme
> The facilitation of learning
> The portfolio of evidence of learning
> The quality assurance of the assessment of learning

This study is only an introductory study and more research needs to be done regarding assessment of learning in outcome-based education in South Africa.

Keywords:

Assessment, critical cross-field outcomes, facilitation of learning, governmental policy, learning, learning programme, NQF / National Qualifications Framework, outcome-based education, outcomes-based education, outcome-based learning, outcomes-based learning, portfolio, SAQA / South African Qualifications Authority, specific outcomes, range statements, unit standard, qualification, quality assurance

Die geïntegreerde en holistiese benadering tot assessering in uitkomsgebaseerde leer in Suid-Afrika

'n PhD proefskrif deur Annette de Jager

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Bloom (1956) beskou leer as die permanente verandering in die kognitiewe, affektiewe en psigomotoriese vaardighede van die leerder. Indien daar in ag geneem word dat leerders verskillende leerstyle het en onderwysers verskillende leer-strategieë toepas, is die vraag wat my nog altyd verwonder sedert ek begin onderwys gee het: "Hoe weet ek of leer werklik plaasgevind het?"

Die enigste manier om vas te stel of leer werklik plaasgevind het, d.i. of daar wel 'n permanente verandering in die kognitiewe, affektiewe en psigomotoriese vaardighede van die leerder plaasgevind het, is om dit te meet. Die konvensionele meetinstrumente in 'n inhoudsgebaseerde leeromgewing is toetse en eksamens. Hierdie benadering lei dikwels tot die eenmalige toekenning van 'n kwalifikasie aan 'n leerder sonder dat die persoon oor akademiese bevoegdhede of lewensvaardighede beskik om die arbeidsmark te kan betree. Ten spyte van die feit dat uitkomsgebaseerde onderwys die geleentheid skep om die produk-gedrewe en memoriseer van feite van inhoudsgebaseerde onderwys te vervang met 'n proses-gedrewe en werklikheidsgetroue assessering van leer, bestaan die vraag of werklike leer plaasgevind het nog steeds. Die fokus van hierdie studie is of die assessering van leer in uitkomsgebaseerde onderwys bevestig dat leer wel plaasgevind het.

Hierdie studie is 'n aksie-navorsing wat gestrek het oor ses siklusse van een jaar elk (1997 – 2002). Dit behels die verandering van die Verdere Diploma in Onderwys (Rekenaargesteunde Onderwys) kwalifikasie soos aangebied deur die Universiteit van Pretoria van 'n inhoudgebaseerde (1997 – 1998) na 'n uitkomsgebaseeerde onderwys benadering (1999 – 2002). Wat aanvanklik na 'n eenvoudig opdrag gelyk het in 1999, het uiteindelik uitgeloop op 'n komplekse uitdaging tot die ontdekking van al die aspekte wat bydra tot die suksesvolle implementering van uitkomsgebaseerde assessering van leer (2002) in Suid-Afrkaanse onderwys, opleiding en ontwikkeling.

Die bevindinge van hierdie ondersoek bevestig dat dit nie moontlik is om evalueringsmetodes in inhoudsgebaseerde leer net eenvoudig na assessering in uitkomsgebaseerde leer[2] om te skakel nie. Uitkomsgebaseerde leer is 'n totaal verskillende benadering en maak aanspraak op 'n interne gedagte sowel as 'n sigbare eksterne verandering. Dit dui daarop dat inhoudsgebaseerde leer nie totaal en al ignoreer kan word nie. Daar is 'n plek vir albei hierdie benaderings omdat dit die behoeftes van leerders aanspreek. Die komplekse probleem van uitkomsgebaseerde leer het nie 'n eenvoudige oplossing nie. Indien al die aspekte wat die strukturering van uitkomsgebaseerde leer behels in ag geneem word, is daar 'n redelike mate van sekerheid dat 'n leerder 'n permanente verandering in kognitiewe, affektiewe en psigomotoriese vaardighede ondergaan het, d.w.s dat leer wel plaasgevind het. Die grootste leemte is onkunde oor die aspekte wat in ag geneem moet word ten opsigte van 'n geïntegreerde en holistiese benadering van assessering van leer in uitkomsgebaseerde onderwys en sluit die volgende in:

> Die regeringsbeleid en huidige opvoedkundige filosofie
> Die ontwerp, ontwikkeling en implementering van 'n leerprogram
> Die fasilitering van leer
> Die portefeulje as bewys van leer
> Die kwaliteitsversekering van die assessering van leer

Hierde studie is slegs 'n inleidende studie en verdere navorsing sal gedoen moet word ten opsigte van die assessering van leer in uitkomsgebaseerde onderwys in Suid-Afrika.

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[2] Die gebruik van die term "inhouds- / uitkomsgebaseerde leer" in plaas van "inhouds- / uitkomsgebaseerde onderwys": In hierdie konteks dui "inhouds- / uitkomsgebaseerde leer" op die mikrovlak van die leeromgewing waar die leergebeure plaasvind.

Acknowledgements

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The reader must take note of the following:

➢ The South African education system provides for education for every member of the rainbow nation:

- Education, i.e. formal education: education in schools, technikons, universities or any other formal and structured way of learning to achieve a qualification

- Training: workplace related sectors where a learner has the opportunity to achieve a qualification

- Development: all other uplifting not including education or training

Those that cannot get formal education can get training in the workplace, and those that do not have the opportunity to either of these have exposure to developmental opportunities. All South Africans can improve their qualifications for a better living.

The reference to South African education, training and development means that what has been done in this study is applicable to assessment in any of these above-mentioned situations.

➢ I use the brackets, e.g. [Chapter 1], to indicate a reference for more information on this topic or concept

➢ I use a table to conceptualise constructs and highlight the similar concepts in the table to simplify the synthesis

➢ I indicate the page numbers when referencing. However, no page numbers are indicated in case of an online reference

➢ The illustrative graphics are the original idea of the author. A Potgieter (Potgieter, 2002) is the designer of these graphics and has been given copyright on the graphics. She is also the designer of the graphic in Figure 1: Representation of the action research model in this study and Figure 7: Visual representation of the critical cross-field outcomes embedded in the outcome-based learning environment

➢ All learners gave permission to copy their work into this document. The original copyright lies with every learner

➢ The South African rainbow nation includes eleven official languages with English as the common denominator. The author's home language is Afrikaans and English is her second language. This thesis was language edited by mrs HP van Aarde without changing my personal character. If the reader finds an "Afrikanism" please bear this in mind …

Prologue: "What this thesis is about ..."

"Imagination is more important than knowledge."
(Albert Einstein, 1879 - 1955)

This thesis is not a conventional thesis.

The author invites the reader to join her on her journey to discover the value of Einstein's observation that "imagination is more important than knowledge". It takes us on an exciting and sometimes philosophical expedition of experiences into the unknown and the unexpected to eventually uncover truth and knowledge, or maybe, just better understanding...

I have always been engaged by the question: "How do I know that learning has taken place?"

We all know there are many theories about "(H)ow does learning happen?" This study is about "(H)ow do I know it did happen?" or "How do I know the learner knows more after the intervention?"

To find the answer I have to "measure" the learning and in outcome-based education this is referred to as "assessment of learning". This thesis is about an integrated and holistic approach to assessment of learning in outcome-based education in South Africa and covers the following:

➢ Learning

➢ An integrated and holistic approach to assessment of learning

➢ Outcome-based education in South Africa

1 Learning

The purpose of this thesis is not to give an in-depth explanation of "learning" or "learning theories". It only refers to learning as the permanent change in cognitive, affective and psychomotor skills of a learner (Bloom, 1956). Taking into consideration the best ways to support educators to improve on teaching strategies [Chapter 5] and also to empower learners with advanced learning strategies [Chapter 6], the crucial questions to address are [Chapter 7]:

➢ "Has the learning really taken place?" or

➢ "How does one know that the learning has really taken place?"

2 An integrated and holistic approach of assessment of learning

To know whether learning has taken place it must be measured [Chapter 7]. Assessment is the vehicle for measuring the evidence of learning. The educator has to develop a framework to measure the changes that have taken place during the process of learning.

Prologue: "What this thesis is about ..."

This study is about the dimensions that contribute to and must be in place for the successful measuring of learning in outcome-based education [Chapter 3, Chapter 4, Chapter 5, Chapter 6, Chapter 8]. It is not engaged in a critique of the system, but seeks to present a snapshot of the phenomenon.

3 Outcome-based education in South Africa

The South African education system is regarded as one of the most modern in the international arena (Mehl, 2001). The biggest shortcoming in the system is the resistance of people to change [Chapter 9]. This resistance can be directly related to a number of factors, some of which may be ignorance and complexity of the terminology, content and nature of the prescribed legislative policies in terms of the educational conceptual framework and their application in practice (Jansen, 1998; Jansen & Christie, 1999).

4 Synopsis

The following is a synopsis of this research.

4.1 Type of research

This thesis reports on an action research conducted over six years where I presented the Further Diploma in Education (Computer-assisted Education) [FDE(CAE)] on behalf of the University of Pretoria (UP). I developed and presented the qualification during 1997 - 1998 in a content-based learning environment and changed it gradually into an outcome-based qualification (1999 – 2002). I collected quantitative and qualitative data [Chapter 2] through experiences, documentation analysis, literature reviews, synchronous and a-synchronous communication, observation checklists, discussions, questionnaires, diaries, interviews and assessment results. The following is a summary of what is to be expected in this study.

4.2 Cycle 1 of the action research: 1997

The FDE(CAE) is a two-year, part-time and post-graduate diploma for qualified teachers and has been presented by UP since 1993. Although there were 14 registrations in 1993 and 1994, no students registered in 1995 and 1996. In 1997 students registered again and I was asked to develop content for the five modules of the qualification [Chapter 4]. Although the government had already adopted an outcome-based education philosophy [Chapter 3], all courses were still presented in a content-based education fashion.

4.3 Cycle 2 of the action research: 1998

The qualification includes two modules on computer skills that are very similar to course material presented for adult training by FUTUREKIDS South Africa (FKSA). Supported by the fact that the South African government promoted partnerships between academic institutions and non-governmental organisations at that time, UP and FKSA signed a contract in 1998 for the presentation of this qualification. The purpose of the contract was to overcome the restriction that only teachers who are able to attend classes at the premises of UP have the opportunity to obtain the qualification. A partnership enables teachers to attend classes at any FKSA training centre across South Africa and involves the following role-players:

➢ A body for the accreditation of the qualification: The Department of Education

➢ A body for the quality assurance of the qualification: UP

➢ A body for the presentation of the qualification: UP in combination with FKSA

➢ A national co-ordinator (the author of the thesis) with the following duties:

  ▪ To design and develop course content according to the prescribed guidelines from UP

  ▪ To co-ordinate the presentation of learning material at the different training venues where the qualification is presented

  ▪ To co-ordinate examinations of the qualification

  ▪ To report to UP on the quality of the course content, the presentation of learning material and the examinations (terminology used in 1997 – 2000)

➢ Educators: UP accredits educators who are employed by FKSA and have completed the FDE(CAE) qualification to present the qualification

➢ Learners: Learners who register for the FDE(CAE) qualification at UP but attend lectures at the different FKSA venues

4.4 Cycle 3 of the action research: 1999

I acted as the co-ordinator of the qualification from 1998 until 2002. I improved on the developed course content in 1998 and 1999, set conventional examination papers and marked them. It soon became clear that there is a remarkable discrepancy in the performances of the students during the year (the semester mark) and the performances of the students in the examination (examination mark) [Chapter 7]. My focus was still very clear in what I was doing and wanted to know:

➢ "Has the learning then really taken place?"

➢ "How does one know that the learning has really taken place?"

When I became interested in the changes that are taking place in South African education, training and development I received training as an assessor and joined a Standards Generating Body in 2000. This made me realise that I had to change the FDE(CAE) qualification and align it with the requirements of the National Qualifications Framework as overseen by the South African Qualifications Authority [Chapter 3].

4.5 Cycle 4 of the action research: 2000

In 2000 I changed the content-based qualification to an outcome-based qualification as follows:

➢   Writing a "unit standard" for each module with "specific outcomes", "assessment criteria", "range statements", "critical cross-field outcomes", etc. and aligning the terminology with governmental policy and educational philosophies, e.g. "teacher" changes to "educator", "student" changes to "learner", "teaching" changes to "facilitation", "evaluation" changes to "assessment", etc. [Chapter 3, Chapter 4]

➢   Expecting the trainers to develop their own learning programmes [Chapter 4] and to become facilitators of learning [Chapter 5]

➢   Introducing a portfolio of evidence for the learning [Chapter 6]

➢   Introducing alternative assessment strategies [Chapter 7]

➢   Overseeing quality assurance of the process [Chapter 8]

It did not take long me to find that there was little comprehension amongst the trainers or the students of my intentions and I had to go back to the drawing board to ensure assessment of learning.

4.6 Cycle 5 of the action research: 2001

Realising that the missing link was knowledge about what was happening in South African education, training and development, I visited the training venues and presented workshops on the following:

➢   The governmental policy and present educational philosophy in the country [Chapter 3]

➢   The design, development and implementation of a learning programme in context of the above-mentioned [Chapter 4, Chapter 5]

➢   The compilation of a portfolio of evidence of learning [Chapter 6]

➢   The implications of the above-mentioned on the assessment of learning [Chapter 7]

➢   The process of quality assurance [Chapter 8]

These workshops were very well accepted and all participants seemed to benefit from them, reporting that notwithstanding many hours of departmental workshops on outcome-based education they had a clear understanding for the first time.

After the workshops I guided the educators and learners through the process of change (there is a change in terminology because of the change from content-based education to outcome-based education: by "educators' I mean people who are responsible for presenting the FDE(CAE) in FKSA centre, and "learners" are the participants enrolled for the qualification). When I did the final interpretations of the assessment of learning, I suddenly realised that I had successfully calibrated the assessment of learning [Chapter 7].

It gradually became clear to me that to know whether learning has taken place is not one-dimensional, but involves a multi-dimensional approach to all the above-mentioned aspects.

4.7 Cycle 6 of the action research: 2002

Assessment in outcome-based education starts when the learner receives the qualification [official documentation as described in Chapter 3] from the educator. The educator develops a learning programme [Chapter 4] to guide the learner during the facilitation of learning [Chapter 5] to compile a portfolio of evidence [Chapter 6] that becomes the official documentation of assessment of learning [Chapter 7] to be quality assured against the requirements [Chapter 8].

At the time of submission of the thesis the final results of the learners for 2002 are not yet available, but the indication is that there is a significant improvement in the learning that has taken place.

Due to the fact that all existing qualifications were only accredited by the South African Qualifications Authority [Chapter 3] for an interim period until 2002, the FDE(CAE) qualification terminates at the end of 2002 and is replaced by the Advanced Certificate in Education (Computer-integrated Education). This does not mean that the principles concerning outcome-based assessment as explained above cannot be applied in this qualification or any other qualification in the country.

4.8 Structure of the thesis

Although paragraph 4.1 to 4.7 explains what is to be expected in this thesis, the reader may have more questions on the structure of the thesis.

As this is not a conventional thesis, the structure needs explanation. Chapter 1 gives a background to the research problem. Chapter 2 describes the action research in context of the study. Chapter 3, Chapter 4, Chapter 5, Chapter 6, Chapter 7 and Chapter 8 are the aspects to consider in the integrated and holistic approach to assessment in outcome-based learning. Chapter 9 summarises the findings.

Prologue: "What this thesis is about ..."

Although each chapter (except Chapter 1 and Chapter 9) has the potential to be an independent research topic it contributes to the process of assessment of learning in context of this research. Therefore none of these can be left out and each chapter takes the format of a mini-research document, including its own integrated literature review, a discussion of the topic, a reference to the contribution in the action research and assessment of learning and finally the findings and recommendations.

The reader may comment: "Why only one chapter on assessment? If there are so many chapters on other topics, is this thesis really about assessment?"

I want to determine whether learning has taken place. To determine whether learning has taken place I have to assess the learning in outcome-based education. To assess learning in outcome-based education I have to integrate all the dimensions that contribute to successful assessment of learning [Chapter 3 to Chapter 8]. I have to explain the holistic approach to assessment in outcome-based learning in South Africa. If I refer to a "unit standard" or "learning programme" in Chapter 7, and to "level 6 on the NQF" in chapter 4, the reader must know what it means. This cannot be reduced to one chapter of a literary review, because it is simply too much and will not be a coherent story. That is why I identified the six integrated dimensions that each contributes to determine the success of learning by successful holistic assessment. Assessment cannot be fragmented or isolated as a stand-alone ... everything the learner does contributes to successful learning and must be assessed against the outcomes.

The following are supportive comments from educators who have been exposed to this perception:

Christa Oelofse (2002)
"What an eye-opener!! I have been teaching for fifteen years and attended all workshops in my learning area, just to get more frustrated by the day. After my exposure to this integrated and holistic approach on assessment of learning I am proud to say that I now understand what it is about for the first time ... and I am a dedicated OBE-educator!"

Martha Sefora (2002)[4]
"After eleven years of actual teaching experience, it is only now that I come to realise what actual teaching is all about. ... The new education system to me is like the birth of a baby who did not go through the process of conception and all the stages of development within the word (i.e. in short, it is like an adopted child). I was expected to implement something that was never broken down to me in such a way that I know its grounding, its good me and learners ... I am a born again teacher the mist that has being covering my eyes it has blown away /clear. I am an asset to myself, my learners, my colleagues and to the nation because of the value that I am adding."

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[4] Not edited and in the original format

Prologue: "What this thesis is about ..."

Graphical representation of the dimensions of assessment of learning

My point of departure is that assessment of learning in outcome-based education has an integrated and holistic approach consisting of six dimensions. Although these six dimensions can be distinguished, they cannot be separated. This idea can be presented in the following diagram.
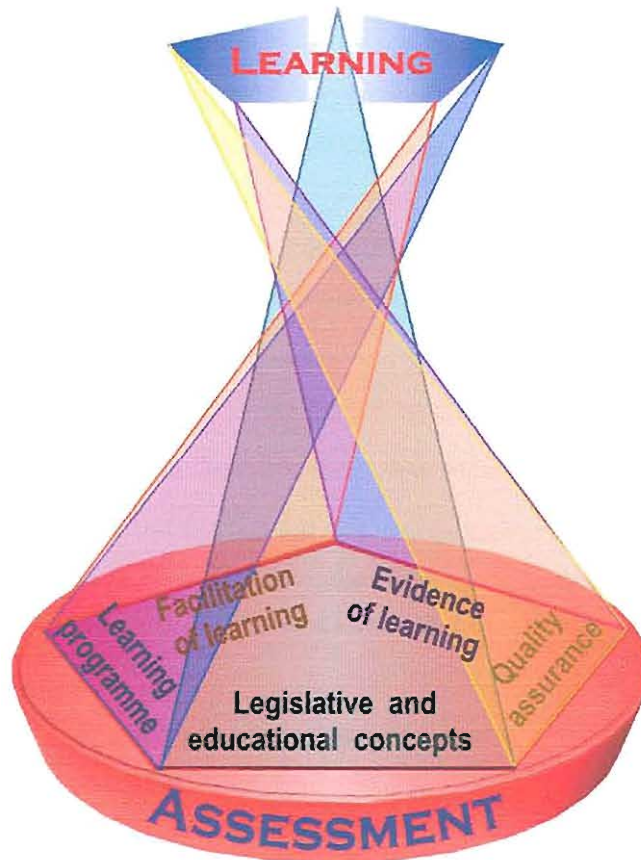
The explanation of this graphical representation is as follows:

> ➢ Assessment is the circular base, because although it is structured, it has no boundaries for the creative educator [Chapter 6]. Whatever the learner does, whenever the learner does it, how the learner does it, etc. can be assessed against the outcomes [Chapter 3]. One can use whatever is possible to determine whether learning has taken place.
>
> ➢ Learning is the smaller pentagonal top. The purpose of assessment is to determine whether learning has taken place and to guide the learner to competence. The outcomes are clearly defined [Chapter 3, Chapter 4, Chapter 5] therefore the learner knows what is expected [Chapter 6, Chapter 7, Chapter 8]. The assessment is therefore a much broader concept than only the learning to be measured.

Prologue: "What this thesis is about ..."

➢ The five three dimensional triangular planes on the circular base of assessment represents the five dimensions that define the integrated and holistic approach to assessment in outcome-based learning put forward in this study.

➢ The first dimension is the legislative and educational concepts of education, training and development in South Africa. Current learning is guided and embedded within a legislative policy and an educational philosophy as determined by governmental policy and present learning theories as described in Chapter 3.

➢ The second dimension reflects the learning programme. Chapter 4 explains the design and development of the learning programme in accordance to the legislative and educational concept.

➢ The third dimension represents Chapter 5 as the facilitation of learning, prescribed by the legislative and educational structures for education and embedded in the learning programme.

➢ The fourth dimension is explained in Chapter 6 as the portfolio of evidence to be collected for competence through the facilitation of the learning as embedded in the learning programme.

➢ Chapter 7 is the fifth dimension and describes the quality assurance of the learning.

All these aspects are interdependent and overlapping and the one cannot exist without the other. This idea is represented in the space between the circular assessment at the bottom and the pentagonal learning on top where the triangular planes intersect, but separate again to form the pillars to balance the outcomes of real learning.

In the thesis this diagram introduces each chapter to orientate the reader and to keep the integrated and holistic perception in mind. However, as learning and assessment are not static processes, the diagram rotates and suggests the preceding chapter and the chapter to follow. This diagram reflects the dynamic nature of the thesis: changing, rotating, pulsating ...

Sometimes the reader uses imagination and sometimes the reader knows exactly what is happening. Sometimes the reader thinks he knows and sometimes the reader knows he doesn't know and has to rethink and read further ... Newton's reference explains that I, while doing this research, often found myself "playing on the seashore, diverting myself every now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me" ...

"I seem to have been only like a boy playing on the seashore, and diverting myself in now and then finding a smoother pebble or a prettier shell than ordinary, whilst the great ocean of truth lay all undiscovered before me."
(Isaac Newton, 1642 - 1727)