

NOT SO MUCH AN AXIOMATIC SYSTEM, MORE A TAXONOMY OF EDUCATIONAL OBJECTIVES¹

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Abstract. By analysing, in detail, the requirements of any axiomatic system, the authors have concluded that it is not possible to ‘Axiomatize the Education System’ in any meaningful way; the process cannot comply with the demands of axiomatization:

- the education system is so large and complex and the number of objectives is (seemingly) endless;
- although it is possible to formulate a system of objectives for education, they are not derived deductively from prior objectives;
- it is not possible to demonstrate that the objectives are derived from the rules of logic; nor that
- the objectives follow logically from a number of objectives that are in turn the logical result of other objectives.

The authors have therefore adapted the process in order to construct a high-level description of the education system; i.e. ‘A Taxonomy of Educational Objectives’ with First and Second Order Objectives.

They have also concluded that an approach using ‘facilitated workshops’ would be very useful in the professional development of politicians, administrators, school leaders, teachers and students.

Keywords: system of objectives; taxonomy; education; axioms; facilitated workshops

Introduction

In a paper presented at the Annual Professional Development Meeting for Teachers and Principals, Budgell and Kunchev (2019) set out to demonstrate that a description of education could be developed in a deductive manner from self-evident axioms.

They sought to:

- determine the intuitive origins of axioms;
- search for axioms that captured the intuitions;
- discover new intuitions that emerged from the axioms and
- sketch out the connections between the axioms (Stillwell 2022).

Axiomatization: the process

Budgell and Kunchev's approach was based on the assumption that **Axiomatization** could be interpreted as the **process** of taking a body of knowledge and working backwards towards its axioms. So, their first task was to agree that body of knowledge; i.e., the key features of the education system. They achieved this in a facilitated workshop.²

Table 1. Examples of Short Statements about Teachers and Teaching

Professional responsibilities		Pupils' learning
	National standards	
Professional improvement		Value individuals
	Collaboration	
Subject knowledge		Teacher qualifications
	Subject knowledge	
Effective planning		Conditions of service

About one hundred intuitions (key features) about the education system were generated in a brainstorming session³; with intuitions being neither prescribed nor proscribed. The intuitions were then written in English and Bulgarian on credit card sized pieces of card. Examples of such 'intuitions' about Teachers and Teaching, for example, are illustrated in Table 1.

Then, without initially specifying the number of groups, these 'credit cards' were sorted into cognate groups and each group was given a short 'working title'. This process was iterative; the groups having to be deconstructed and reconstructed until an agreed pattern was achieved (see Figure 3). When the cognate groups and their titles were agreed, the 'working objectives' were re-written to form coherent objectives for the education system; for example:

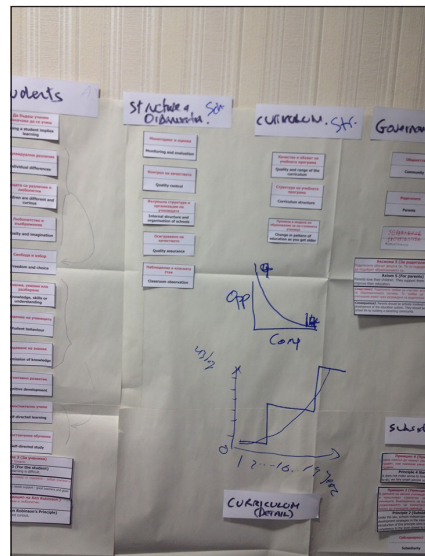


Figure 1⁴

‘The **Teacher**’s role must develop as pupils mature; changing from the dispenser of core knowledge to the facilitator of self-directed learning.’

Although they could be described as intuitions or obvious ideas about the education system, the coherent objectives were seen to constitute **First Order Axioms**. The original short objectives, generated in the facilitated workshop, were then re-written to form the subordinate **Second Order Axioms**.

In their discussions, Budgell and Kunchev:

- stated the **First Order Axioms** explicitly rather than them being generally implied; and

- concluded that the intuitions generated in their facilitated workshop could be interpreted as the **First** and **Second Order Axioms** of the education system.

They assumed that the audience would have some knowledge about the education system and the ability to draw upon that knowledge to understand how the **First Order Axioms**: pupils, education, the state, subsidiarity, schools, leadership and management, the curriculum, teachers and teaching, assessment and accreditation and monitoring and evaluation; were being used.

In addition, there were many **Second Order Axioms**; intuitions that were commonly used in the education system. Furthermore, as the **Second Order Axioms** were articulated and defended, the listener was asked to look around and observe the routine functioning of the education system (any education system in ‘the real world’).

However, the authors now have serious doubts about their project: is it really possible to consider education as an Axiomatic System.

WHAT IS AN AXIOMATIC SYSTEM?

A1. Axiom comes from the Greek *axiōma* (ἀξίωμα) ‘that which is thought worthy or fit’ or ‘that which commends itself as evident’.

A2. An axiom is a statement that is so evident or well-established, that it is accepted without controversy or question.

A3. An axiom is a premise or starting point for reasoning: a statement that serves as a starting point from which other statements are logically derived.

A4. Axiomatization is the process of taking a body of knowledge and working backwards towards its axioms.

A5. Axiomatization is the formulation of a system of statements (i.e., **axioms**) in order that a **consistent** body of propositions can be derived deductively from these statements.

A6. An axiomatic system is said to be **consistent** if it lacks contradiction; i.e., it is impossible to derive both a statement and its negation from the system's **axioms**.

A7. An axiomatic system is called **complete** if every statement, or its negation, is derivable from the system's axioms (that is to say, every statement is capable of being proved to be true or false).

A8. In the education system, the **axiomatic method** is a way of proving the truth of statements.

A9. To **axiomatize** the education system is to demonstrate that its claims are derived from a well-understood set of sentences, basic concepts/terms and the rules of logic – **First Order Axioms**.

A10. In order to apply to the education system, **First Order Axioms** are substantive assertions about aspects of the system.

A11. For a statement in the education system to be true, it follows **logically** from a number of statements that are in turn the **logical** result of other statements.

A12. **Consistency** is a key requirement in the education system, as the presence of contradiction would allow any statement to be proven.

A13. In the education system, axioms are **independent** if they are not proved or disproved by other axioms in the system.

A14. In a proof in the education system there are certain statements called **First Order Axioms** that are taken to be true without justification.

A15. Because it minimizes the number of **First Order Axioms**, **independence** is important in the education system.

A16. Each **First Order Axiom** is followed by the list of subordinate axioms - **Second Order Axioms**.

A segue from axioms to objectives

Budgell and Kunchev paper set out to investigate the possibility of **Axiomatizing the Education System**.

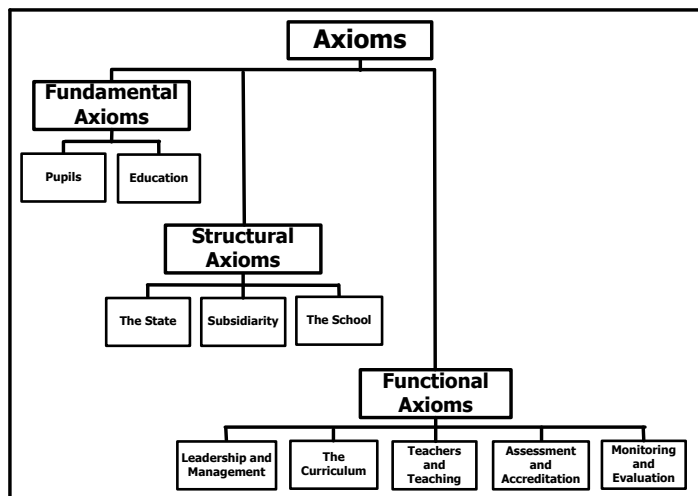


Figure 2a. The Structure and Organisation of First Order Axioms

By providing a convenient overview of **First and Second Order Axioms**, Figure 2a illustrates to extent to which this has been successful, for example:

A16. Each **First Order Axiom** is followed by the list of subordinate **Axioms - Second Order Axioms**.

However:

A16 (cont'd). Because the education system is so large and complex, the number of **Second Order Axioms** is (seemingly) endless. Furthermore, **Second Order Axioms** are not always **independent** and are clearly related to the **Second Order Axioms** subsumed under other **First Order Axioms**.

Furthermore:

A5. It is possible to formulate a system of objectives for education, but they are not derived deductively from prior objectives.

A9. It is not possible to demonstrate that the **First Order Axioms** are derived from the rules of logic; nor that

A11. The **Axioms** follow **logically** from a number of objectives that are in turn the **logical** result of other objectives.

This is probably the stage at which Budgell and Kunchev concluded that their project could not be completed: it is not possible to '**Axiomatize the Education System**' in any meaningful way; the process cannot comply with the demands of axiomatization. It was time to adapt the approach in order to construct '**A Taxonomy of Educational Objectives**' with **First and Second Order Objectives**.

A taxonomy of educational objectives: first (fo) order objectives

FO1. Pupils develop their knowledge, skills and understanding through a process of education and become socially adjusted individuals.

FO2. Education enables pupils to maximize their potential and become well-adjusted members of society.

FO3. It is **The State's** responsibility to effectively and efficiently allocate and delegate sufficient resources to enable schools to meet the personal, social and intellectual needs of the pupils.

FO4. The School creates the environment, opportunity and conditions that enable pupils, teachers and parents to interact and achieve the objectives of education.

FO5. Subsidiarity ensures that decisions about the education of pupils are taken at the level closest to the point of delivery.

FO6. Effective Leadership and Management of a school ensures an excellent quality of education and high standards of achievement.

FO7. The Curriculum provides sufficient breadth and balance while enabling pupils, as they mature, to exercise increasing choice of the subjects that they wish to study.

FO8. The **Teacher's** role must develop as pupils mature; changing from the dispenser of core knowledge to the facilitator of self-directed learning.

FO9. The reliable and valid **Assessment and Accreditation** of pupils' work provides information about the individual pupil's knowledge, skills and understanding; it enables them to know what they have to do to improve and ensures access to the next stage of education.

FO10. An effective system of **Monitoring and Evaluation** provides an external validation of the quality of education provided and the standards of achievement of the pupils.

Once the **First Order Objectives** have been clearly articulated, it is apparent that they represented different aspects of the education system: fundamental aspects, structural aspects and functional aspects. Figure 2a can be redrawn to illustrate how the **First Order Axioms** have been grouped into:

- **Fundamental Objectives**
 - Pupils
 - Education
- **Structural Objectives**
 - The State
 - Subsidiarity
 - The School
- **Functional Objectives**
 - Leadership and Management
 - The Curriculum
 - Teachers and Teaching
 - Assessment and Accreditation
 - Monitoring and Evaluation.

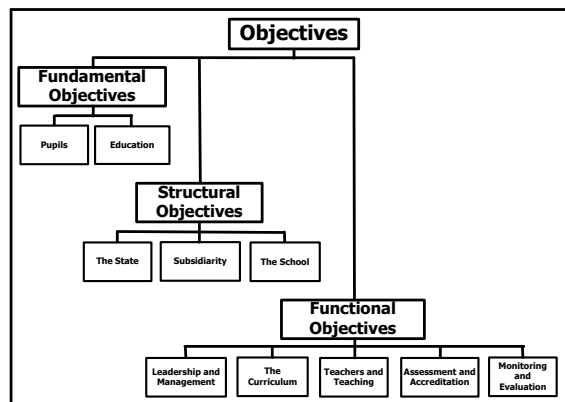


Figure 2b. The Structure and Organisation of First Order Objectives

First (fo) and second (so) order objectives of the education system
The overall structure is represented diagrammatically in Figure 3.

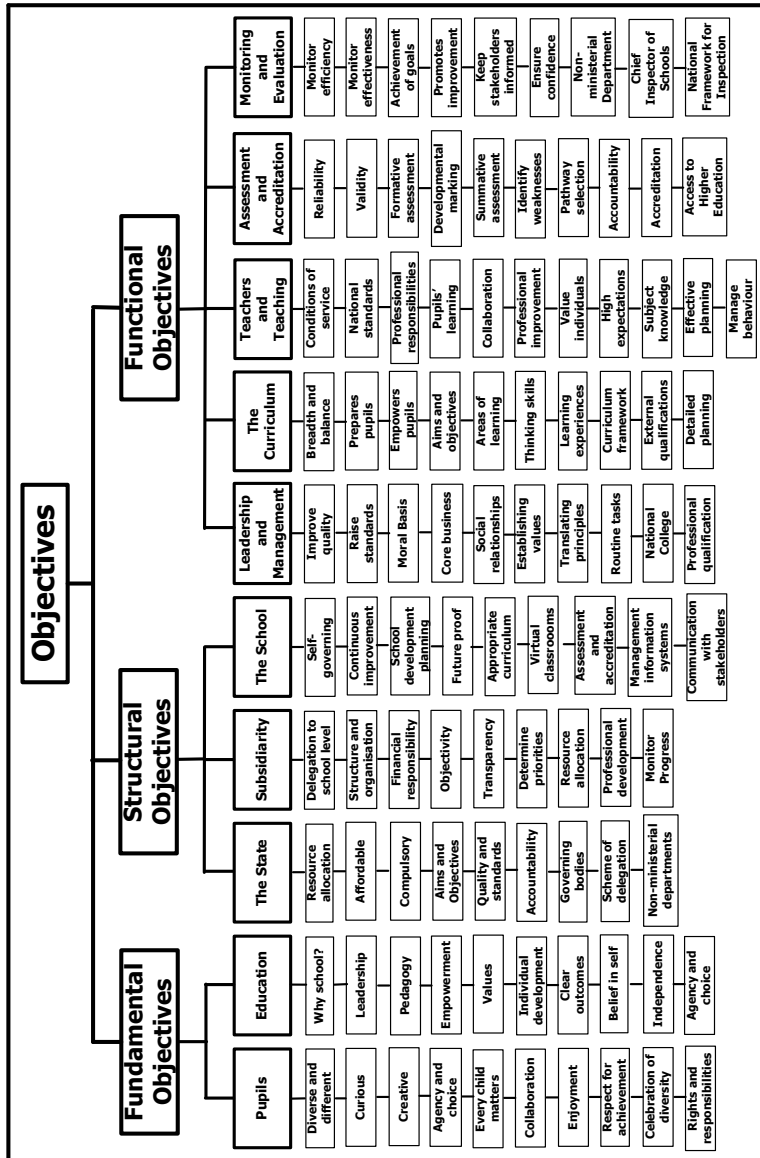


Figure 3. The Overall Structure of First and Second Order Objectives

The Fundamental Objectives

FO1. Pupils develop their knowledge, skills and understanding through a process of education and become socially adjusted individuals.

SOPu1. Pupils are naturally different and diverse.

SOPu2. Curiosity makes **pupils** learn almost without further assistance.

SOPu3. Pupils are inherently creative.

SOPu4. Pupils have the right to attend a **School** where everyone works together, knowing that all human beings are equal, valuable.

SOPu5. Pupils have the right to respect, kindness and courtesy: **Schools** in which every child matters, every day.

SOPu6. Pupils have the right to enjoy their learning, to feel cared for and protected and to have their achievement respected – in whatever form it takes.

SOPu7. Pupils have the right to an **Education** that celebrates diversity.

SOPu8. Pupils have the right to an **Education** that teaches about responsibilities, rights, personal integrity, duties and citizenship.

SOPu9. Pupils have the right to an **Education** that gives them the freedom to innovate and disagree; to think independently; and to exercise agency and choice;

FO2. Education enables students to maximize their potential and become well-adjusted members of society.

SOEd1. The Education debate is conducted at three levels:

- Philosophical
 - Why **School**? Is the primary purpose of education to benefit the individual or the collective society?
- **Leadership and Management**
 - the scheduling of classes
 - the blocking of time
 - the selection of textbooks
- **Teachers and teaching**
 - teaching methods
 - self-directed learning
 - project-based learning
 - outdoor education.

SOEd2. Education is a means to empower **Pupils** to become active participants in the transformation of their societies.

SOEd3. Education also focuses on the values, attitudes and behaviours which enable individuals to learn to live together.

SOEd4. The primary purpose of Education is to build up of the capacity of the individual for the *benefit that individual*.

SOEd5. The Education System has clear and measurable outcomes.

SOEd6. *Pupils leave the Education System believing that they are good learners.*

SOEd7. *Pupils leave the Education System being independent and self-sufficient.*

SOEd8. *Pupils leave the Education System more capable of thinking clearly and making their own Choices.*

SOEd9. *The priority of Education is respect for the Agency of the individual.*

The Structural Objectives

FO3. It is The State's responsibility to effectively and efficiently allocate and delegate sufficient resources to enable schools to meet the personal, social and intellectual needs of the students.

SOST1. It is **The State's** responsibility to ensure that the resources allocated to **Education** are deployed efficiently and effectively.

SOST2. It is **The State's** responsibility to ensure that:

- equal educational opportunities are available to everyone;
- parents send their children to school;
- education is affordable for everyone;
- democracy is preserved; and
- a common social fabric is created where all are respected and accepted.

SOST3. When significant responsibility, authority and accountability is delegated to the **School**, **The State** determines the frameworks for:

- aims and objectives;
- policies;
- priorities;
- quality and standards;
- accountability; and
- the appropriate conditions for individual development.

SOST4. In **Education** systems that are characterised by The Local Management of Schools with Local Financial Management, The State develops:

– the legal framework for the establishment of Governing Bodies – local partners who support and challenge Leadership Teams in the discharge of their responsibilities.

– a Scheme of Delegation that specifies the rights and responsibilities of school Leadership Teams and Governing Bodies with clearly identified financial regulations and procedures.

SOST5. For those functions that require a national perspective, **The State** does not retain direct administrative control. It is delegated to non-ministerial departments, standing committees or working parties that report direct to parliament.

FO4. Subsidiarity ensures that decisions about the education of pupils are taken at the level closest to the point of delivery.

SOSu1. Subsidiarity is the principle that the Ministry of Education and Science should have a subsidiary function, performing only those tasks which cannot be performed at **The School** level.

SOSu2. Subsidiarity is the principle of social organization that holds that educational issues should be dealt with at the most immediate (or local) level that is consistent with their resolution.

SOSu3. When applied to the structure and organisation of the **Education System**, **Subsidiarity** is concerned with the delegation of **agency** and **choice** to **The School**.

SOSu4. The quality of the education system depends on delegating **agency** and **choice** to the level which is closest to the Pupil.

SOSu5. It is **The State's** responsibility to determine the structure and organisation of the education system and the levels to which **agency** and **choice** and their rights and responsibilities should be delegated.

SOSu6. The allocation and delegation of financial responsibility (Local Financial Management) is the most powerful indicator of the principle of **Subsidiarity** being in place.

SOSu7. The principles, the criteria and the formula for allocating resources are:

- open, transparent and objective; and
- reflect the real costs inherent in education.

SOSu8. The principle of **Subsidiarity** assumes that:

- improving the quality of education; and
- raising standards of achievement.

is the responsibility of **The School**. **The State** does not be take centralized decisions on:

- the allocation of resources within **The School**;
- the detailed planning of **The Curriculum**; and
- different approaches to teaching.

FO5. The School creates the environment, opportunity and conditions that enable pupils, teachers and parents to interact and achieve the objectives of education.

SOSc1. Schools comply with national policies, expectations and standards.

SOSc2. Schools are self-organising, complex systems in a radically re-designed environment free of local municipal control.

SOSc3. Schools maintain a high quality of education and high standards of achievement within a cycle of continuous improvement.

SOSc4. Schools are age and stage specific.

SOSc5. Schools meet the requirements of **The Curriculum** and (for older **Pupils**) the requirements of the system of **Assessment and Accreditation**.

SOSc6. Schools are housed in suitable buildings with appropriately furnished classrooms and learning spaces.

SOSc7. Schools are future proof, they:

- provide increasing opportunities for independent learning in virtual classrooms;
- regulate the use of **The School** website, cloud technologies and social networks;

- ensure that **Pupils** can positively and confidently engage with the digital world; and

- ensure that **Pupils** have the skills and knowledge to effectively use digital technologies to participate in society, communicate with others and create and consume digital content

SOSc8. The future **School** develops a School Handbook to support and strengthen the relationship between **Schools**, local stakeholders and parents:

- the School Handbook outlines all national policies in addition to those school policies that apply specifically to their students.

SOSc9. The future **School** involves its stakeholders in School Development Planning.

SOSc10. The future **School** is dependent on a very high-level Management Information System that facilitates the exchange of information between:

- **Pupils**, teachers and parents; and
- **The School** and **The State**.

The Functional Objectives

FO6. Effective Leadership and Management of a school ensures an excellent quality of education and high standards of achievement.

SOLM1. There is a high correlation between the quality of **Leadership and Management** and organizational success.

SOLM2. Effective **Leadership and Management** are fundamental to improving the quality of education.

SOLM3. Effective **Leadership and Management** are fundamental to raising the standards of achievement.

SOLM4. **Leadership** is balanced by effective **Management**: the strategic and operational perspectives are closely interrelated.

SOLM5. Successful Leaders in Education are those who can balance principle, purpose and people:

- Principle – the moral basis of **The School**;
- Purpose – the core business of **The School**; and
- People – social relationships in **The School**.

SOLM6. **Leadership** is concerned with the values by which **The School** operates:

- personal values;

- the prevailing moral consensus in society; and
- the dominant moral hegemony.

SOLM7. Management is concerned with:

- translating principles into actual practice;
- ‘doing things right’;
- focusing on systems, structures and delivery.

SOLM8. Administration is about:

- doing all the routine tasks;
- the organisational routines; and
- infrastructure.

SOLM9. A team of local partners (a **Governing Body**) is established to support and challenge the **Leadership Team**; helping them to fulfil their responsibility for the leadership and management of **The School**.

SOLM10. The **Governing Body** is responsible for working with the **Leadership Team** to ensure that **The School** delivers:

- an excellent quality of education; with
- very high standards of achievement.

SOLM11. The **State** establishes a **National College for School Leadership**.

SOLM12. The **National College for School Leadership** develops:

- a curriculum (a body of knowledge, skills and understanding) that is the foundation for Leadership and Management in Schools;
- a National Professional Qualification for School Leaders that is a professional qualifying examination that teachers must pass before they apply for and are appointed to a post of **Headteacher**;
- a support programme for newly appointed Headteachers;
- a support programme for Middle Managers that enables Department, Faculty or Functional Leaders to improve their knowledge, skills and understanding of **Leadership and Management**.

FO7. The Curriculum provides sufficient breadth and balance while enabling students, as they mature, to exercise increasing choice of the subjects that they wish to study.

SOCu1. The Curriculum is broad and balanced.

SOCu2. The Curriculum promotes the spiritual, emotional, moral, cultural, intellectual and physical development of **The Pupils**.

SOCu3. The Curriculum prepares **The Pupils** for the opportunities, responsibilities and experiences of life by equipping them with appropriate knowledge, understanding and skills.

SOCu4. The Curriculum empowers **The Pupils** to achieve their potential and to make informed and responsible decisions throughout their lives.

SOCu5. The Curriculum is specified in terms of:

- an overarching curriculum aim;
- curriculum objectives;
- areas of learning and subject strands (contributory subjects);
- cross-curricular skills;
- thinking skills and personal capabilities;
- learning experiences to which **The Pupils** must be given to access; and
- attitudes and dispositions which **The Pupils** must be given the opportunity to develop.

SOCu6. The State determines the structure and organisation of **The Curriculum Framework** that provides **The Pupils** with the opportunity to choose the subjects that they wish to study as they mature.

SOCu7. Because **The Curriculum** for older **Pupils** is driven by external **Assessment and Accreditation**, **The State** specifies the content and assessment requirements of all subjects taught in schools.

SOCu8. Within **The School**, **The Teachers** plan in detail how and when they organise the content, the teaching and the assessment of **The Curriculum** in their subject.

SOCu9. The School is responsible for keeping the Governors, parents and **The Pupils** apprised of the structure and organisation of **The Curriculum**.

FO8. The Teacher's role must develop as students mature; changing from the dispenser of core knowledge to the facilitator of self-directed learning.

SOTe1. The State specifies the national conditions of service and remuneration under which **Teachers** are employed.

SOTe2. Teachers clearly understand and always act within the statutory frameworks which set out their professional duties and responsibilities.

SOTe3. Teachers make the education of **The Pupils** their first concern and are accountable for achieving the highest possible standards in work and conduct.

SOTe4. Teachers demonstrate consistently high standards of personal and professional conduct.

SOTe5. Teachers maintain public trust in the profession and maintain high standards of ethics and behaviour.

SOTe6. Teachers have proper and professional regard for the ethos, policies and practices of their school and maintain high standards in their own attendance and punctuality.

SOTe7. Teachers see themselves as members of a professional learning community that is committed to:

- ensuring that students learn;
- a culture of collaboration;
- focussing on results; and
- hard work and commitment.

SOTe8. Teachers value each and every **Pupil**; they own the responsibility to identify and develop every **Pupil's** positive attributes.

SOTe9. Teachers have consistently high expectations of **The Pupils'** attitudes to learning and standards of achievement.

SOTe10. Teachers have a deep knowledge and understanding of the subjects they teach. They plan lessons effectively, making maximum use of lesson time and coordinating learning resources.

SOTe11. Teachers question **The Pupils** effectively and demonstrate a clear understanding of the ways they think about the subject.

SOTe12. Teachers manage **Pupils'** behaviour effectively with clear rules that are consistently enforced.

FO9. The reliable and valid Assessment of pupils' work provides information about the individual pupil's knowledge, skills and understanding; it enables them, their teachers and their parents to know what they have to do to improve and it ensures access to the next stage of education.

SOAA1. Formative Assessment provides **The Pupils** with accurate information about their knowledge, skills and understanding.

SOAA2. In order to motivate **The Pupils** into raising their standards of achievement, **Formative Assessment** is accompanied by developmental marking.

SOAA3. Reliable and valid **Formative Assessment** provides very important feedback for the teacher and allows parents to follow their children's progress and to be aware of their standards of achievement.

SOAA4. Summative Assessment undertaken at the end of the module, course, year or school provides:

- a measure of **The Pupils'** standards of achievement;
 - the teacher with an indication of any weak areas in the quality of their teaching;
- and
- the Leadership Team with an early indication of any teacher who is beginning to fail in the classroom.

SOAA5. When it is analyzed and presented effectively, reliable and valid **Summative Assessment**, provides parents with appropriate information about:

- the strengths and weaknesses of their children; and
- the strengths and weaknesses of schools.

SOAA6. National (**State**) examinations fulfill the following functions, they:

- **Accredit** the knowledge, skill and understanding of the **Pupils** in a particular field, subject or profession;
- allow **Pupils** to be awarded a diploma, degree or qualification that acknowledges the level attained;
- function as an 'entry ticket' to the next stage of education.

SOAA7. The School presents to Governors, parents and **The Pupils**, the results of any evaluation of **The Pupils'** performance in National (**State**) examinations.

FO10. An effective system of Inspection provides an external validation of the quality of education provided and the standards of achievement of the pupils.

SOME1. The State's provides reliable and comprehensive information about the efficient and effective deployment of tax-payers' money.

SOME2. Schools have significant autonomy and are therefore fully accountable for the results of their activity: this is only achieved when there are periodic **Inspections**.

SOME3. Inspections provide an evaluation of the extent to which each **School** has achieved its goals: this motivates **The School** to search for ways to improve their outcomes.

SOME4. The Inspection of Schools performs five essential functions it:

- provides parents with information that informs their choices and preferences about the effectiveness of **The Schools** their children attend or will attend in the future;
- keeps **The State** informed about the work of **The Schools** which provides assurance that minimum standards are being met;
- provides confidence in the use of public money;
- assists accountability; and
- promotes the improvement of individual **Schools**, and the **Education System** as a whole.

SOME5. A State that introduces a system of independent **School Inspections** first establishes a non-ministerial department that is **independent** of the Ministry of Education and reports directly to **Parliament**.

SOME6. It is Parliament that appoints a **Chief Inspector of Schools** who is directly and indirectly responsible for evaluating and reporting on the work of the Ministry of Education.

SOME7. Therefore, the Chief Inspector of Schools is independent, and is seen to be independent, of the Ministry of Education.

SOME8. In an open and transparent process, the Chief Inspector of Schools is responsible for:

- the development of a **National Framework for the Inspection of Schools**;
- the appointment of a team of highly qualified and experienced inspectors;
- the development of a comprehensive training programme to ensure that the inspectors are properly equipped to fulfil the role; and
- establishing internal procedures to ensure the quality of any published reports.

An overview

A careful reading of the main text and of Figure 3 indicates that some **Second Order Objectives**, subsumed under a particular **First Order Objective**, are closely related, if not identical, to **Second Order Objectives** subsumed under other **First Order Objectives**. For example: there is a close relationship between

The State's responsibility for Quality and Standards;

The School's responsibility for Continuous Improvement;

The Leadership and Management Team's responsibility for Improving Quality and Raising Standards;

Teachers' responsibility for having High Expectations of The Pupils;

The role of Assessment and Accreditation in Identifying Weaknesses; and

The role of Monitoring and Evaluation in Monitoring Effectiveness.

Figure 4 illustrates the relationship between **Second Order Objectives** that refer to pupils and that are subsumed under both the **First Order Objective - Pupils** and other First Order Objectives.

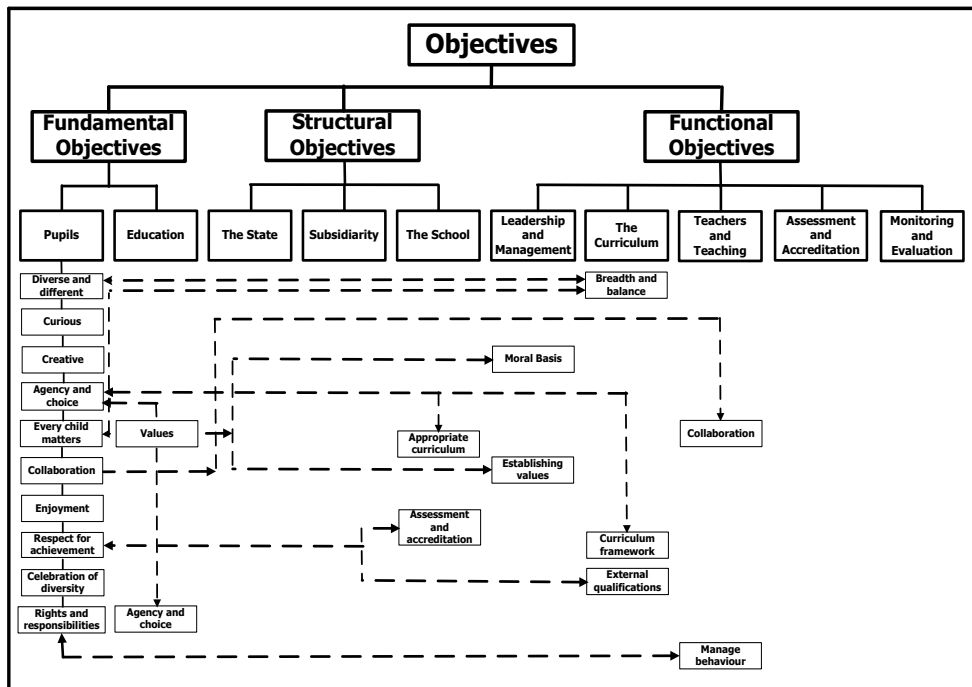


Figure 4. The Connections between Second Order Pupil Objectives and other Second Order Objectives

Similarly, Figure 5 illustrates the relationship between **Second Order Objectives** that refer to the curriculum and that are subsumed under both the **First Order Objective – The Curriculum** and other First Order Objectives.

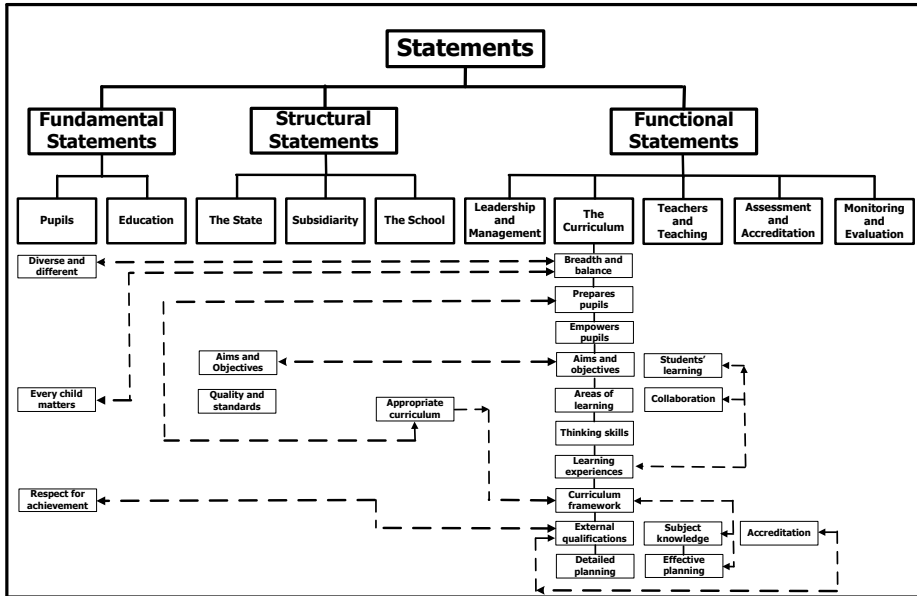


Figure 5. The Connections between Second Order Curriculum Statements and some other Second Order Statements

The process

The stages in the facilitated workshop:

1. the generation of the key intuitions about the education system;
2. grouping those intuitions into cognate groups; and
3. ascribing a title to each group

are, in themselves, very productive and provide a high-level **Taxonomy of Educational Objectives** that could be part of:

a) the professional development of politicians, administrators, school directors, teachers and students; or

b) a school-based in-service programme where the staff are divided into cross-subject groups to generate their own structure and organisation for the key features of education.

The objective would not be to generate a ‘single correct answer’; it would rather be to facilitate an open and transparent process during which key intuitions would arise during the discussion.

The product

The process indicates that it is certainly possible to:

A4. take a body of knowledge and work backwards towards its **Objectives**.

However, because the education system is so large and complex and because so many **Objectives** can be generated, it is:

1. impossible to ensure that any particular **Taxonomy** provides a **complete** analysis of the education system;
2. impossible to ensure that the **Second Order Objectives** are **independent**;
3. impossible to derive the **Objectives** logically from a number of statements that are in turn the **logical** result of other statements.
4. certain that alternative, and equally valid structures could be generated by different groups of participants.

That no single **Taxonomy** can be used to describe and interpret every aspect of the education system does not render the approach redundant; The **First and Second Order Objectives**, that are summarized in Figure 3, provide a powerful description of the education system.

Different group of participants in different facilitated workshops will produce a different collection of intuitions of the education system and, therefore, different 'cognate groups'. These alternative perspectives could actually be useful in a school-based in-service event, where the different groups might produce very different versions of Figure 3. This very outcome could then form the basis for a plenary session at the end of the event.

An alternative approach would be for the workshop organiser to facilitate the generation of short statements; but at the end of that stage specify the cognate groups that are to be used; for example:

- Raising Standards of Achievement;
- Improving the Quality of Education;
- Professional Development;
- Future Proofing;
- Every Child Matter;
- Agency and Choice;
- Delegation to the Local Level;
- Aims and Objectives.

These would then become the **First Order Objectives** in an alternative Figure 3.

A third approach would be to restrict the actual title of the facilitated workshop to a narrower **Objective**; for example, **Raising Standards of Achievement**, **Future Proofing** or **Pupils with Special Educational Needs**. and use the process to generate a programme or course of action. Essentially, this would generate **Third Order Statements** of the education system.

In conclusion

It is not possible to **Axiomatize the Education System**. The system is so complex that too many of the requirements of **Axiomatization** cannot be met. However, the process would be very useful in:

1. producing a **Taxonomy of Educational Objectives** - a high-level description of the education system; and
2. the professional development of politicians, administrators, school leaders, teachers and students.

NOTES

1. The title for this paper is derived from ‘Not so much a programme, more a way of life!’, a satirical programme on the BBC in the 1960s.
2. A facilitated workshop is a powerful means of achieving consensus among the participants as to the intuitions or key features of any system. In the education system, they could be used, for example, in the professional development of school leaders or in ‘whole school’ in-service days.
3. A group problem-solving technique that involves the spontaneous contribution of ideas from all members of the group.
4. A photograph taken during a break in the workshop.

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