The IEA Curriculum:
Core Document

Revised Edition - 2017

International Education Agency of Papua New Guinea

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Contents

Foreword

Learners in today's schools face many complex, diverse and uncertain global and local social, economic, political and environmental issues. Rapid technological progress, changing family and institutional structures and increasing cultural diversity all influence and are influenced by education.

The IEA School Curriculum has been developed within this dynamic environment and contains the mandatory curriculum framework for all IEA schools for students up to Grade 8. It provides a foundation for system wide accountability, and a broad, clearly articulated policy framework within which the system management can be effectively devolved.

The curriculum provides a guarantee of high standards to the IEA's clients, and concise direction for school staff involved in implementing and supporting the curriculum.

In support of the curriculum, the IEA is committed to the regular monitoring of school level implementation and to the provision of comprehensive, on-going curriculum support. This involvement in school level curriculum also enables the regular review of the curriculum documents in response to changing needs and new developments in education.

The IEA Board of Directors has determined that all schools will be required to operate within the curriculum framework outlined in this document

Suzanne Savage
Director of Education

> ## Our Mission Statement
>
> The International Education Agency provides high quality private education, meeting the needs of individual learners in a caring environment.

Introduction

To fully develop the talents and capacities of all students in line with its mission statement, the IEA provides a broad and balanced curriculum designed to promote intellectual, creative, personal, physical and recreational skills and understandings. The curriculum fosters an appreciation of the natural and social environments, encourages a sense of responsibility towards these and helps students develop strong self-concepts and hence promote responsible independence and moral autonomy. It helps students learn to appreciate the value systems implicit in national cultures, and to recognise the need for tolerance and understanding.

Through the curriculum the IEA supports schools in developing and delivering programs by providing a strong focus for teaching and learning and clear statements of what students are expected to achieve.

The IEA curriculum has been developed in the PNG context and in collaboration with Papua New Guinean and international school practitioners. It provides a framework which supports teachers in their efforts to optimise the educational experience at an international level in a local setting.

Because it is attuned to the goals and aspirations of the government and people of Papua New Guinea, the IEA is mindful of its duty to contribute to the nation's development through the education of its students and through the development of its teachers. The IEA has a particular focus on developing the literacy and numeracy skills of both teachers and students.

All IEA schools strive to prepare students for life in a multi-cultural society, providing experiences leading to an appreciation and understanding of the culture of PNG within the context of the global community.

> The IEA holds ultimate responsibility for the operation and performance of all of its schools. When families pay for an IEA education they expect the highest standard of curriculum, teaching and student welfare.
>
> The IEA curriculum reflects thoroughly researched international best practice. While each school has the freedom to adapt the curriculum to suit local circumstances, the fundamental learning outcomes and approaches to pedagogy are not negotiable and must be followed by all IEA schools.

Learning in Our Schools

All students have an entitlement to access a broad, challenging and appropriate curriculum to meet their individual strengths and needs. Students need a range of experiences to achieve their full potential and to become lifelong learners.

In order to motivate students to have high aspirations and to want to achieve, students, teachers and parents need to work to create a stimulating and successful learning environment. Students should be fully involved in the learning process, promoting an active culture of learning.

The ultimate goal of learning in all IEA schools is to work towards our overriding goal of *developing connected lifelong learners* who:

- behave ethically
- are self-directed learners
- communicate effectively
- analyse and solve problems and
- work collaboratively.

These attributes are the *five key outcomes* that underpin our profile of a successful learner. They are explained in more detail later in this document.

What We Believe About Learning

We believe that learning

- is a life-long journey in which the learner makes connections that develop new and existing knowledge, skills and understanding
- is the process by which an individual makes sense of new experiences and engages in metacognition
- takes place when the individual constructs their own knowledge and understanding of a subject, skills or values
- takes place through interaction with others and in individual reflection
- occurs anywhere and at anytime

The diagram below shows how learning must be seen more broadly than only the case of a teacher interacting with a student.
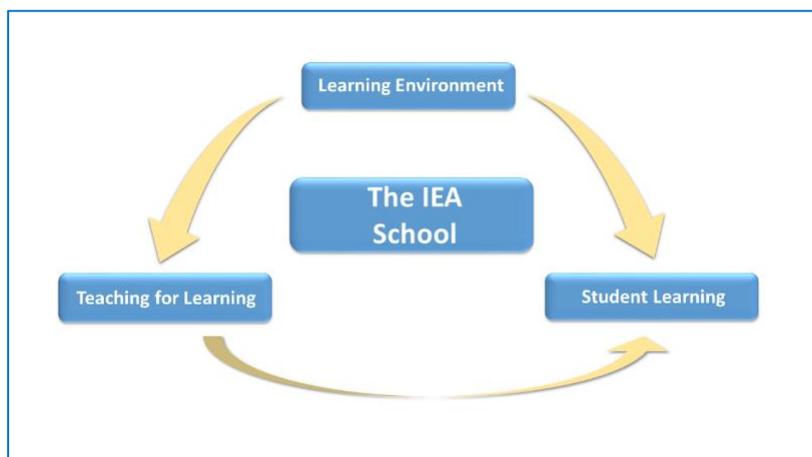
To be successful, there are three aspects which interact with each other to provide for a quality learning experience.

The Learning Environment

There must be an environment which supports learning with the right culture, relationships and resources. The environment is the context of the learner and it should be structured to ensure it develops and supports a culture of learning across the school. It must be secure and stimulating and ensure it provides the right conditions for learning to occur.

The environment can be broken into the following three broad areas:

1. The Social and Cultural Environment where

- relationships are positive and based on trust and encouragement
- collaboration, both in the classroom and across a world-stage, is a major factor that empowers student learning
- the student voice is valued and empowered
- self-efficacy and self-esteem are nurtured
- the principles of social justice, citizenship and equality are promoted
- differences are valued and respected

2. The Pedagogical Environment where

- processes and strategies are highlighted and contribute to students who are skilled in metacognition
- all are considered learners – students, teachers, leaders, parents
- real-world inquiry and problem-solving are an integral part of the classroom
- 'virtual' and 'real' interact in a seamless way to support relevant and meaningful learning
- rich questioning arouses excitement, motivation and curiosity
- thinking is valued and challenged

- w productive errors are seen as a natural part of the learning process

3. The Physical Environment where

- w learning spaces encourage inquiry, collaboration and reflection
- w educational, physical, human and capital resources are designed to maximise learning
- w safety, security and comfort are fundamental elements of the physical design

Teaching for learning

Research has demonstrated that there is no single element more important in student learning success than the teacher. We need to be very clear about the role of our teachers, the skills they need and the behaviours they model.

Our curriculum can only be implemented by teachers who

- w have a sound knowledge of the approaches and conditions that will maximise learning
- w use all relevant data to know the learner and their needs
- w develop a positive and productive learning environment
- w monitor progress closely and adjust the learning environment where necessary to support student learning
- w ensure learning is active and collaborative and builds on prior understanding
- w build students' metacognition skills
- w   encourage students to make connections, generalise their learning and provide experiences that encourage them to solve problems and interact with the world in a meaningful way.
- w teach for deep understanding
- w value diversity in thought, ability, ethnicity and opinion
- w model a growth mindset by emphasising processes of learning, the excitement of new challenges, putting in effort and using strategies which help students to learn.
- w provide feedback to students about the nature and progress of their learning
- w support the development of effective thinking skills

Student learning

Students are not 'empty vessels' waiting to be filled with knowledge. They join our schools having already learnt a great deal, and they need to leave us with the ability to manage their own learning for the rest of their lives. They are always highly active participants in the learning process.

Our curriculum assists students to

- experience the ways in which learning takes place
- be actively engaged in the learning process
- think independently and can question their own thinking and that of others
- know what they need to do to improve and are able to set appropriate goals
- transfer skills and understanding to other contexts
- engage with learners beyond their classroom as they solve relevant and meaningful real-world problems
- make decisions based on relevant data
- make ethical decisions that reflect strong personal values
- value diversity
- demonstrate curiosity, flexibility and adaptability

Key Outcomes for IEA Schooling

The IEA works within both the Papua New Guinea and international visions of education towards preparing young people to be valuable participating members of their communities. Students are helped to develop the skills to choose new opportunities and technologies, and to use these widely in a rapidly developing global community.

It is in this context that the IEA expects its schools to be learning communities of students, families and teachers who pursue academic excellence and the social development goals of equality, justice and human dignity. Schools can ensure they do this by providing opportunities for each child's intellectual, physical, social, moral and aesthetic development.

Schools provide students with opportunities to develop the knowledge, skills, attitudes and values needed for the changing vocational and social needs of the twenty-first century. These needs include:

- the valuing of lifelong learning
- a commitment to democratic ideals
- a pride in their diverse cultures
- the ability to be adaptable and enterprising
- the skills to work individually and collaboratively

The learning outcomes outlined in each curriculum document provide guidance in developing learning experiences in the classroom. The key outcomes outlined below provide the broad focus for all learning activity in IEA schools. They provide the IEA stakeholders with a common understanding of what the IEA learner will have achieved through their education in our schools. They form the basis of our learning culture.

The IEA key outcomes are that each child will ...

... be self-directing
One who is self-confident, has high self-esteem and personal integrity with a positive vision for self and the future.

Evidenced by	w being able to set, evaluate and achieve realistic personal goals with initiative, commitment, perseverance, courage and enterprise w being self-monitoring, self-managing and self-modifying and assuming responsibility for actions w a healthy lifestyle

... communicate effectively
One who confidently conveys and receives information, instruction, ideas and feelings appropriately and effectively in a range of different cultural, language and social contexts.

Evidenced by	w reading, viewing, listening, writing, presenting, speaking and numerating with a demonstrated awareness of and responsiveness to different language conventions and interpretations w the ability to discriminate and critically analyse a range of communicative sources

... behave ethically
One who exhibits appropriate morals, manners and virtues in a range of social and cultural settings and a sense of their own spirituality.

Evidenced by	w the demonstration of honesty, respect, humility, trust, integrity and fairness in multicultural community relationships

... work collaboratively
One who develops good relationships with others and works in cooperative ways to achieve common goals.

Evidenced by	w the ability to monitor behaviour as a group member w demonstration of interactive communication and consideration of individual differences w the ability to assess and manage group functioning with joint ownership of responsibility for group actions and decisions.

... analyse and solve problems
One who accesses a range of information sources appropriate to the resolution of complex issues and applies strategies with accuracy and thoroughness.

Evidenced by	w the ability to identify, describe and redefine a problem and then to inquire and research, explore, generate and develop ideas with imagination and creativity, initiative, reflection and flexibility.

Addressing the Key Outcomes through English and Mathematics

Regardless of the curriculum area, teachers need to focus on ways in which teaching and learning can help deliver the five Keu Outcomes. The following notes show how teaching and learning in English and Mathematics can make this contribution.

Key Outcome *Each Child will …*	English	Mathematics
be self-directing	The ability to interact, negotiate, reflect, investigate and analyse are essential skills in setting, achieving and evaluating realistic goals, and are major components in becoming self-directed.	Mathematics is a tool for life which improves the capacity to analyse and deal with everyday situations, and to pursue one's own interests. At the same time, mathematics education involves providing students with a chance to investigate their world using the tools of mathematics.
communicate effectively	Effective communication forms the basis of positive interactions. Our students need to develop the skills, strategies and experiences which enable them to give and receive information, ideas and feelings in a variety of contexts with confidence.	The language of mathematics is part of everyday life and communications. It is used when conducting business, shopping, or enjoying sports; a knowledge of number, shape and measurement is required to be able to communicate effectively. Advances in technology have resulted in a huge growth in the availability of information which has led to a need for basic skills in statistics and the ability to interpret and evaluate information.
behave ethically	High level language skills are vital in helping individuals value the dignity and worth of those around them.	A knowledge and sense of mathematics allows us to consider the ethics of situations more accurately. Often ethical arguments are supported with numerical and statistical evidence. Interpreted incorrectly these can lead to serious errors of judgement. Through learning in mathematics students become more skilled at testing assertions and hypotheses. They begin to realise the power of mathematics in supporting arguments and have a chance to consider the consequences of the misuse of this power.

Key Outcome *Each Child will …*	English	Mathematics
work collaboratively	**The skills developed through the learning of the English language enable students to work collaboratively. This allows the members of a group to formulate and communicate goals and to assign tasks. Learning in English empowers students to interact, explain and negotiate within collaborative situations.**	**Many of the activities which involve working with others in the real world require some skills in mathematics. For example, in most cases personal and professional financial and budgeting decisions are made in consultation with others. Additionally, mathematical investigations and problem solving often require the combined efforts of a group, giving an opportunity for this skill to develop.**
analyse and solve problems	**The development of language skills improves the ability to think creatively about problems. With good language skills students can access relevant information from a wide range of sources and judge the relevance and importance of the information collected.**	**Problem solving is at the very core of mathematics. Virtually all mathematical activity is concerned with applying learning to real world situations and to solving problems. While mathematics provides a vehicle for learning to analyse and solve problems, the skills of problem solving learnt in mathematics can be applied in a wide range of situations.**

The IEA Curriculum: Foundations

The IEA Mission Statement outlines a set of beliefs which guide the operation of IEA schools. From this foundation a set of principles have been developed which reflect system wide commitment to current educational thought and provide a framework within which IEA schools implement the curriculum. These principles are broad enough to enable teachers to develop and implement innovative programs. Further information regarding pedagogical practice can be found in the individual curriculum documents.

Principles of developmental learning, partnerships, communication and continuous improvement reflect the processes and structure central to the IEA curriculum.

> These driving principles are intended to support the achievement of the IEA's goal of
>
> ## Developing connected lifelong learners

The promotion of intellectual, creative, personal, physical and recreational skills and understandings

A wide range of skills is vitally important to a child's education. Schools strive to equip students to contribute to the economic, cultural, recreational and pastoral well-being of the community so that they may become valuable citizens.

Fostering of appreciation and responsibility towards natural and social environments

Concern with the quality of the environment, both the natural and the social, has become a major political, economic and cultural issue. The youth of today will hold the responsibility in the future for preserving the environment in its delicate balance. The school's curriculum accepts the task of preparing students for this complex but essential role.

A focus on learning

The school's curriculum is designed to ensure that the emphasis is on the student learning rather than the teacher teaching. It ensures a stimulating environment in which students can examine in detail the processes they must move through in achieving desired outcomes. The focus for the teacher and the student is to move learning forward.

The achievement of each individual's full potential

All students can learn. The IEA is committed to a learner centred approach to curriculum delivery. A range of learning opportunities is provided to ensure optimum student achievement.

Reflection of an understanding of the stages of child development

Students pass through definable stages of development. They do not, however, all develop at the same rate. While most IEA schools group students according to age, the curriculum is sufficiently flexible to ensure that students are engaged in learning experiences appropriate to their individual stages of development, and not dictated by grade placement or the stages of commercial programs.

Development of the ability to engage with change

Our world changes so quickly, and the future has become so difficult to predict, that change will be a constant and major aspect of the adult lives of every student in IEA schools. Since the IEA draws its student population from a diverse range of national and cultural backgrounds, the curriculum focuses on the development of this ability to adapt and to understand the nature of change.

Development of strong positive self-concepts

The curriculum provides opportunities for students to become attuned to their own self-worth, and to develop sound levels of self-awareness and esteem.

Appreciation of the value systems of national cultures

International schools in PNG have a wonderful opportunity to provide students with first-hand experience of a wide variety of cultures. The curriculum makes use of these opportunities to ensure a broad inter-cultural knowledge and respect.

Maintenance of close communication with the student's home and family

The student's home has significance in education which often surpasses that of the school. Curriculum planning within schools must absorb the desires and needs of the family, and provide for communication of educational progress with the family. Education is a cooperative process.

Opportunities for teacher professional growth and development

All teachers need to be current in professional practice. The isolation and communication barriers faced by teachers in many IEA schools require a concerted effort from all stakeholders to facilitate professional development for teachers.

Curriculum Areas

The IEA curriculum is structured around three broad areas;

English

> Current curriculum released in 2017

Mathematics

> Current curriculum released in 2016

Inquiry

> Currently under development.

> This area encompasses the 2005 curriculum documents in the areas of

> w Society and Environment

> w Science

> w Technology

> w Health and Personal Development

School Based Specialist Areas

Although IEA curriculums were published in the following two areas they are no longer mandatory in schools. Instead schools are required to deliver locally developed programs in these areas:

> w The Arts (music, visual arts, drama, dance)

> w Physical Education

The outcomes and strategies outlined in these various documents are intended as the basis of individual schools' curriculum planning for Grades Prep to 8. In grades 9-12 the teaching program will be guided by the demands of externally set curricula and examinations.

Schools need to develop programs which provide for the achievement of curriculum outcomes for all students. Above all, outcomes provide guidance for the focus of assessment.

Early Childhood

There is no explicit IEA curriculum for Early Childhood. The broad goal of early childhood education is to prepare students both socially and academically to commence formal schooling in a Prep class.

The *IEA Early Childhood Framework* outlines the system beliefs about quality learning in the early years and offers guidance in planning a meaningful early childhood program.

In addition, the IEA publishes support materials developed with a view to ensuring readiness for the achievement of the Level 1 (Prep) learning outcomes in the curriculum, and supporting the implementation of appropriate best practice teaching strategies.

Perspectives

The following three broad areas are *perspectives* which need to be reflected across all curriculum areas.

The PNG Context

Papua New Guinea is a unique country with a multicultural context which cannot be found in any other place on Earth. Over 800 languages (more than a quarter of all languages) are spoken within its small area. More than 1500 different counting systems have been recorded. While writing was not invented by any Papua New Guinean society, there remains a strong oral tradition which has successfully transferred knowledge, culture and a deep relationship with the land for around 50,000 years.

In its short history of contact with the world beyond its borders, spanning much less than one half of one percent of its total history, PNG has been bombarded by change. While the core of its culture remains, and must be respected by anyone who would strive to educate the nation's youth, there is also massive pressure to understand and, at times, adopt aspects of other cultures. There are unique values enshrined in the Melanesian culture and a sense of equity and justice demands that this be preserved if PNG is to take its own unique place in the wider world.

The IEA strives to ensure that western educational ideas and the English language do not subvert the actualisation of being a Melanesian in a global society. There must be a strong commitment to the view that there is significant educational advantage for students whose prior knowledge is valued and built upon when they enter school.

Each of the IEA curriculum documents includes a section which outlines ways in which the subject can be taught with PNG Perspectives in mind.

Equity

All students in IEA schools have the right to take full advantage of the education they are offered. Care must be taken that schools provide equal access and opportunity to all students and do not inadvertently advantage some students over others, either through oversight or through subtle processes which may be so ingrained in practice that they are simply overlooked.

Given the importance placed on 'learner centred' education, teachers are faced with the challenge of ensuring that all students have equal access to learning and to all available resources. We must ensure that the curriculum caters for the needs, interests and the diverse ways in which children learn.

International Standpoints

Students from a diverse range of cultural groups from both 'inside' and 'outside' Papua New Guinea attend IEA schools.

The IEA curriculum outcomes outline a learning journey which prepares students for the next stage of schooling whether it is in Papua New Guinea or elsewhere in the world. The Curriculum interfaces especially well with the curricula of western countries.

A central theme in the development and implementation of the IEA curriculum is the question of what it means to be educated as a person growing up and living in Papua New Guinea. For some students this is their permanent home, for others a home away from the country they call home. IEA curriculum developers are also mindful that some students will never have one country they call home. However, for all IEA students, Papua New Guinea is the place in which they are currently growing up and as such these students live, contribute to, participate with and indulge in the culture and society that is Papua New Guinea.

An IEA education enables students to learn to view people around the world from multiple perspectives and emphasises the essential oneness of humanity and nature especially in the coherence of land, people, nature and time.

As an 'international minded educator' the IEA has developed a curriculum which helps teachers confront stereotypes and resist simplification of other cultures. IEA schools

- foster the habit of examining multiple perspectives,
- teach about power, discrimination and injustice,
- explore global issues, and
- provide cross cultural experiential learning.

In IEA classrooms teachers ensure students acquire skills to work across cultures and encourage students to personalise their own connections with other countries and cultures.

The IEA curriculum provides a framework for schools when exploring cultural experiences and cultural diversity programs which recognise and value the traditions, histories, and languages of the cultures within Papua New Guinea:

- examining issues related to racism and explore ways to promote non-racist attitudes and behaviour in the school and wider community,
- recognising that students may need to meet more than one set of cultural expectations,
- considering members of cultural groups within the local and wider community when including aspects of content related to those cultures.

Curriculum Structure

Strands, Substrands and Levels

The IEA Curriculum is organised into three broad areas: English, Mathematics and Inquiry. Each of these areas is further divided into *strands* and in most cases the strands are divided into *sub-strands.* The precise details of this structure is shown in the following sections dealing with each individual curriculum area.

In each curriculum area the student learning outcomes are arranged around five achievement *levels* for students from Prep to Grade 8. The diagram below shows the relationship between levels and ages assuming that students have begun their learning in a given curriculum area at the beginning of school aged five years old.
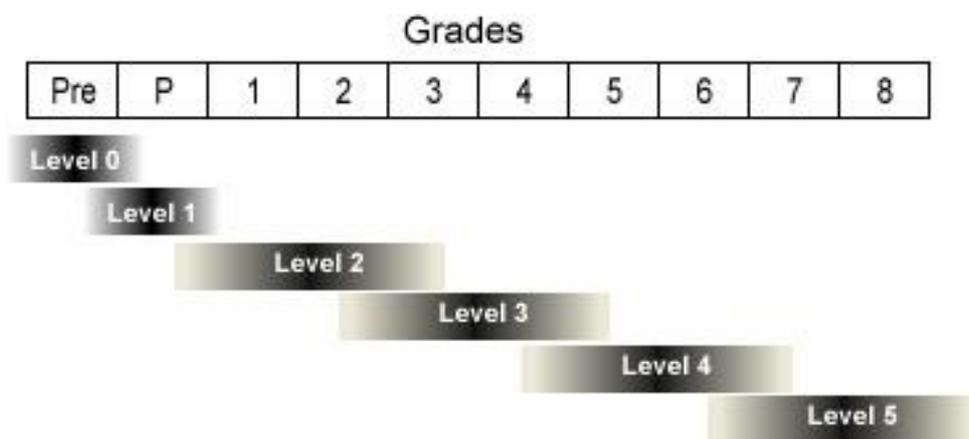
Each *learning outcome* in the curriculum is presented within a strand or substrand and at a particular level. The curriculum can be regarded as *spiral* because with a strand or substrand the outcomes at one level build upon those at the previous level.

Not all strands span the entire 5 levels. Some start in the early grades and are fully completed after two or three levels. Others do not start until the middle primary grades.

Elaborations

In English and Mathematics, each outcome is expanded and clarified by a short document called an *elaboration.* This serves to expand the outcome into a range of observable behaviours which would indicate outcome achievement, and provides suggestions of the types of activities which would be likely to lead to effective learning and assessment. In some cases further background information is provided to teachers.

An Outcomes Based Approach

The identification of learning outcomes allows for a clear overview of the curriculum, presented in a way that ensures that students move along a continuum to achieve the next level of learning of which they are capable.

Outcomes describe some form of achievement for the student. The achievement described can be quite broad but it must embody something that at one stage in the student's development they could not do, and at a later stage they could. Ideally outcomes are determined through a process of *designing down* from higher order outcomes.

Within this approach, specific decisions about teaching/learning activities are the responsibility of schools and individual teachers, although the curriculum documents provide a range of suggestions of activities which would contribute to outcome achievement. There is not a one-to-one correlation between outcomes and learning experiences. A given activity might serve a range of outcomes, levels, or even curriculum areas.

Progress is monitored and accountability is ensured through assessments which relate directly to the outcome being taught. These assessments may take many forms (see the section on Assessment) but in every case provide the student with an opportunity to demonstrate achievement of the outcome.

English

The IEA is committed to a balanced literacy approach to the teaching and learning of English skills. Our goal is that children grow to be life-long readers and writers and develop effective speaking and listening skills.

In order to motivate students to have high aspirations as literate individuals, the classroom environment, the teaching program and the learning opportunities afforded them all need to work together to stimulate both the desire and the need to develop high functioning skills.

Language is the central tool for all learning. The better students' skills become in using their language, the more effectively they will be able to learn across the curriculum. Other curriculum areas also provide the context within which students learn language. The chance to discuss, read and write about a diverse range of subjects ensures that language learning occurs naturally and effectively. While language learning is a discrete curriculum area, much of its content occurs within the framework of other curriculum areas. Therefore, language development is the responsibility of all teachers.

Aims

As a result of engagement with the English curriculum students will be able to:

- w Speak, listen, read, view and write with enjoyment, purpose, effect and confidence in a wide range of contexts;
- w Utilise the power of language to persuade, to express and arouse feelings, ideas and emotions;
- w Use resources effectively to enhance learning in all areas;
- w Analyse language critically.

Structure

The outcomes identified in the IEA English Curriculum are organised into four broad **Strands** each with two or three substrands:

Reading	Print Concepts
	Reading Strategies
	Comprehension
Writing	Writing Fundamentals
	Creating Texts
	Production and Distribution
Speaking and Listening	Comprehension and Collaboration
	Presentation of Knowledge and Ideas
Language	Conventions
	Word Study

Approach to Teaching and Learning

The teaching of English (Reading, Writing, Speaking and Listening) in the IEA is based on a curricular methodology that ensures a balanced literacy approach where children learn reading, writing, listening and speaking in an integrated and stimulating natural-language environment. This environment encompasses a range of experiences and approaches that encourage children to take increasing responsibility for their learning. The goal being that children grow to be life-long readers and writers.

A balanced literacy approach provides a balance between, and integration of, explicit teaching and modelling of the skills and strategies readers and writers need, with a wide variety of experiences and using a wide variety of authentic texts. It includes direct and indirect instruction of reading and writing including teaching phonemic awareness, phonics, fluency, vocabulary and reading comprehension and writing text types, spelling, grammar and punctuation.

Skills and strategies of reading, writing and speaking and listening should be taught in integrated authentic situations using the components of a balanced literacy program. Children should be speaking and listening in relation to what they are reading and writing. Grammar is taught during shared writing where the grammar is seen in the context of a text type and a purpose e.g. teach verbs when writing procedural text; teach direct speech when writing narratives.

Through the components of a balanced literacy approach, the teacher implements a well-planned literacy program that reflects a gradual release of control, whereby responsibility is gradually shifted from the teacher to the students.

Mathematics

Mathematics is an integral part of our existence. It is a highly-interconnected subject that has developed over thousands of years, providing solutions to problems throughout history. Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy. It is a subject that is constantly developing due to the expansion of digital technologies, which provide access to new tools to explore and create new ideas.

The IEA Mathematics curriculum should provide students with knowledge, skills and conceptual understanding in Number, Measurement and Geometry and Statistics. It focuses on developing communication, reasoning and problem-solving skills. These skills are important in enabling students to make informed decisions and solve problems when faced with familiar and unfamiliar situations relevant to their education and everyday lives. The ability to make informed decisions and to interpret and apply mathematics in a variety of contexts are essential life skills. To participate in society, students need to be able to critically evaluate ideas and arguments that involve mathematical concepts.

Mathematics involves a search for patterns and relationships and is an exciting and satisfying subject to learn. It should encourage students to become self-motivated learners through mathematical inquiry and to actively participate in challenging and engaging learning experiences. It holds an inherent interest for young children, this can be maintained through effective teaching which emphasises practical relevance.

Aims

The IEA Mathematics Curriculum aims to ensure that students:

- develop an understanding of mathematical concepts, fluency with processes and the ability to recall and apply knowledge efficiently and accurately;

- are confident communicators of mathematics, able to apply their knowledge and skills in mathematics to investigate, reason and to solve a range of problems;

- recognise connections between aspects of mathematics and other subjects, and appreciate that mathematics is an important aspect of lifelong learning.

Structure

The outcomes identified in the IEA Mathematics curriculum is organised into four broad **Strands** each with two or three substrands:

Thinking Mathematically	(this strand has no substrands)
Number	Number & Place Value
	Addition & Subtraction
	Multiplication & Division
	Fractions & Decimals
	Money & Financial Mathematics
	Patterns & Algebra

Measurement & Geometry	Units of Measurement
	Shape
	Location & Transformation
Statistics	Chance
	Data

Approach to Teaching and Learning

The IEA approach to teaching mathematics is based on five principles:

w   a daily lesson dedicated to mathematics;

w   interactive teaching and oral work with the whole class and groups;

w   an emphasis on mental calculation;

w   use of concrete materials to enhance learning with understanding;

w   controlled differentiation, with all students learning mathematics connected to a common theme.

The following components are central to successful implementation of these guiding principles:

w   feedback that is positive, responsive to student needs, and identifies the next steps in learning;

w   quality models of mathematical strategies using appropriate vocabulary, resources and visual displays;

w   accurate, well-paced expectations that explore *why* and *how* certain strategies work;

w   talk-time that involves varied interactions and requires students to share strategies and approaches to solving a problem in a diverse range of ways,

w   technical vocabulary development;

w   time and opportunity to develop mathematical fluency;

w   instruction that is proactively planned for and tailored to suit the individual needs of each student and at an appropriate level to challenge growth;

w   formative assessment strategies that establish where each student is in their learning, what the next steps are for that individual, and how they are going to reach their learning goals;

w   problem-solving that allows for communication, reasoning and opportunities to develop skills and strategies;

w   regular short practice for mental calculation to help improve recall of knowledge;

w   whole-class and group interactive teaching during which students are expected to play an active role by responding to questions, contributing points to discussion, and explaining and sharing methods to the class or group;

w   sharing and discussing learning intentions, ensuring that students are clear about what they are learning;

w   questions which match the direction and pace of the lesson, and that are geared and resourced to ensure that all students participate;

w   constructive responses to student contributions to move learning forward.

The IEA approach to teaching mathematics promotes the use of concrete materials to assist students in learning mathematics with understanding.

Inquiry

The Inquiry Curriculum is currently under development. However, at this stage it is anticipated that it will be organised around a number of strands each with an orientation to either Science and Technology or People and Societies. In some cases, the strands will be oriented towards both of these areas. The following table summarises the proposed structure.

Science and Technology Orientation	People and Societies Orientation
Matter Living things Earth and Beyond Energy Materials	Time, Continuity and Change Culture and Heritage Resources and Economic Activities Social Organisations
Place and Environment	
Health of Individuals and Populations	
Technology	
Human Development and Relationships	

Strands for the Proposed Inquiry Curriculum

The curriculum will be delivered through a series of inquiry units developed either by the school or the system. Not all strands will be addressed at every curriculum level.

Implementing the Curriculum

The implementation of the IEA curriculum is the most important task performed within the school. While individual teachers are the most heavily involved in this task they do not do it alone. Successful curriculum implementation is a team effort involving a range of participants.

The following paragraphs outline the responsibilities of those involved in curriculum development and management.

The International Education Agency

The responsibilities of the International Education Agency relating to curriculum development and implementation are to:

- w monitor, develop and review curriculum directions and guidelines
- w provide support to schools to cater for the professional development of their staff
- w encourage and facilitate communication between schools on curriculum matters
- w monitor the needs of principals and teachers as they relate to curriculum and to respond to those needs.

The Principal

The responsibility for curriculum implementation rests with the school principal. Indeed, the most important responsibility of the principal is the planning and management of effective curriculum implementation. The specific responsibilities of the principal with regard to curriculum are to:

- w assess the needs of the students and ensure that these are reflected in curriculum decision making
- w utilise the skills of teachers in such a way as to ensure that each makes the greatest possible contribution to curriculum implementation
- w coordinate the supply and use of resources to ensure their maximum effectiveness in the implementation of the curriculum
- w ensure parents and the community are well informed about the curriculum,
- w ensure that valid assessment and evaluation procedures are in place
- w ensure that appropriate pedagogical practices are occurring

The Teacher

Every teacher has a unique set of experiences and talents which, under the leadership of the principal, can be valuably utilised in the tasks of curriculum implementation and management. The responsibilities of the teacher with regard to curriculum are to:

- w contribute to broad discussion in such a way as to help determine appropriate direction for school level curriculum decision making
- w seek professional development opportunities from a variety of sources and to communicate new ideas to colleagues

- accept and carry out those tasks of curriculum management and implementation required by the principal
- carry out the assessment and evaluation of each student.

The School Board

The school Board represents the local school community and is responsible for ensuring that the school is able to achieve its broad goals. The responsibilities of the school Board relating to curriculum are to:

- assist the principal in determining the needs and aspirations of the local community
- monitor the progress and to provide whatever assistance may be required to facilitate the achievement of curriculum goals
- assist the principal in communicating to the community the various curriculum initiatives in place within the school.

Parents and the Community

The parents and community have a right to contribute to the determination of the school's broad goals and a responsibility to exercise this right. In addition to those of the school board, the responsibilities of the parents and community relating to curriculum are to:

- share information with the school about the students in their care so that the welfare and learning needs of each can be addressed
- gain an understanding of the curriculum so that aspects of the child's education which occur at home can be harmonised with school experiences
- encourage enthusiasm for the school throughout the broader community.

Subject Time Allocations

Educational research supports the need for a deliberate focus on the development of literacy and numeracy in the first three to five years of school with other curriculum areas integrated throughout the learning program. There may be an increasing level of subject specialisation as students progress through primary and into secondary school.

IEA policy number 98 states that schools are required to provide a minimum of direct instructional time of 23.75 hours per week in primary grades and 26.66 hours per week in secondary grades. This does not include administration and other non-instructional activities.

School Curriculum Policy

Schools have a responsibility to make several important policy decisions in implementing the IEA Curriculum. Such policy making involves all professional school staff and should be clearly documented and accessible to all.

While there will naturally be considerable variation between schools in terms of precise policy decisions, the main elements of a school curriculum policy are:

School culture

While the learning outcomes in the IEA curriculum are designed for all students, their achievement will present a range of challenges from school to school. Schools should carefully identify and consider those local factors which affect the implementation of the curriculum including community and school values, economic and geographic issues, school history and tradition, and future expectation.

Organisation

Effective curriculum implementation is built upon a foundation of sound organisation of staff, time and resources. Schools need to determine staffing structures which allocate responsibility for the supervision of, development and specialised implementation of the curriculum. Attention must be paid to the establishment and communication of workable timetables, class organisation, programming procedures, and long-term whole-school curriculum plans.

Assessment and Evaluation

Assessment and evaluation are integral parts of the curriculum and essential for effective curriculum implementation. Formative and summative assessment and evaluation are carried out for a variety of purposes, some elements of which are mandated by the IEA and external curricula.
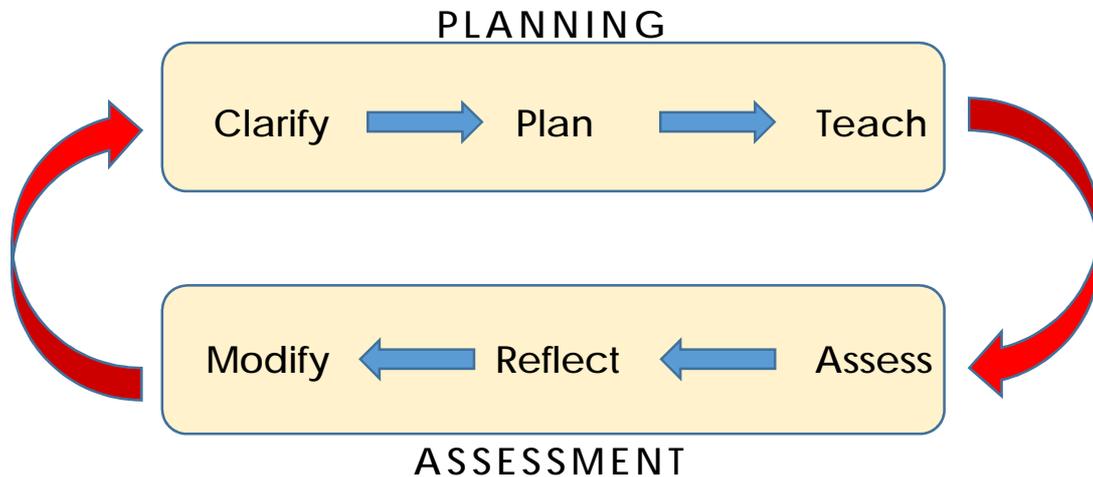
Resources

Most resource decisions relate to specific curriculum areas and are best documented in those sections. However, some resources and their inventory, such as the school library, computers, audio-visual equipment and sporting facilities will need specific policy decisions if they are to be used effectively. These decisions include the identification of staff responsibilities and the timetabling of their use.

Individual Curriculum Areas

Several decisions will need to be made about the implementation of curriculum areas either as separate areas or through integrated approaches. These will include the availability and use of specific resources, the selection of particular approaches to teaching and learning, the nomination of curriculum content including the allocation of particular content to specific grades, and the nature of relationships between curriculum areas. These decisions will help to ensure continuity of learning through the grades.

Planning and Assessment

Planning and assessment are vital to identify what learning and teaching will be taking place so that standards of achievement for all students continue to improve. It is a process by which assessment informs future planning to ensure the student's learning is appropriate to the current level as shown in the following diagram.

PLANNING

Clarify ➡ Plan ➡ Teach

Modify ⬅ Reflect ⬅ Assess

ASSESSMENT

Planning

w **Clarify: Determine which aspects of the curriculum are to be delivered by selecting the relevant curriculum outcomes**

w **Plan: Devise a range of rich teaching and learning strategies, ensure availability of relevant resources, and determine what assessments will be used to monitor student progress.**

w **Teach: Implement the plan.**

Assessment

w **Assess: Gather a range of rich data which is relevant to the targeted outcomes and to individual students, using a variety of techniques.**

w **Reflect: Consider the implications of the data which has been collected and determine the degree to which each student has achieved or moved towards the planned outcomes.**

w **Modify: Determine what changes will need to be made in the next planning round to allow for greater student success.**

A Special Note About the Planning and Assessment Cycle

The cycle does not occur in any set or prescribed time period.
It takes place over a whole year, a term, a week, a lesson and even several times during a lesson.

Planning Fundamentals

While each curriculum document provides more specific guidance on planning in that area, the following fundamental beliefs underpin planning across the curriculum in IEA schools.

- w Planning should take account of prior learning, levels of attainment and appropriate targets for the age and/or ability of the class/group/individual.

- w Planning for next steps should take account of previous student achievement and experiences within a whole school context.

- w Students should be actively involved in the planning process in order to maximise student engagement and achievement.

- w Curricular content should be balanced over a period of time. This will not always be over a day or week. However, the subject balance will be achieved over the course of the year.

- w The curriculum offered should give opportunities for extended and sustained learning activities which often cover more than one skill area and subject.

- w Wherever possible learning should be based on active experience, encouraging the use of a range of skills and building on previous knowledge and experience.

- w Each student should progress at an acceptable level of pace and challenge through the curriculum and should learn by building on and extending existing knowledge, skills and understanding.

- w Differentiation should be addressed within each class teacher's short term planning, to meet the needs of abilities of groups of students and individuals.

Planning Documents

In each curriculum area there will be three levels of planning document which are described below.

Long Term Planning Documents

The long term plans provide proposed coverage in each subject for each curriculum level or grade level, and should illustrate continuity and progression. Long term planning is used to inform medium term and short term planning. It should generally be developed by the whole school or whole curriculum level to ensure consistency across classes and continuity between grades.

Long term plans generally cover one to two years and should contain:

- w IEA key outcomes

- w IEA subject outcomes (or reference to the outcomes)

- w Details of the main focus for each term for each subject

Medium Term Planning Documents

Medium term plans should be developed with a team approach by those dealing with a particular curriculum level. They will usually cover a full term or semester and should contain:

- w IEA key outcomes
- w IEA subject outcomes
- w Clear learning intentions, showing evidence of the unpacking of IEA subject outcomes
- w Key resources
- w Key subject vocabulary
- w Identification of learning processes where appropriate i.e. stages of the inquiry process, the technology process
- w Data required to determine whether an outcome has been achieved, and an indication of how tis data will be collected.
- w Differentiation, where appropriate (expectations of students should be identified on subject plans).

Short Term Planning Documents

Short term planning is the responsibility of individual teachers although may be the product of a team approach by teachers on the same curriculum level. It ensures there is good classroom organisation, sufficient time given to assessment, a range of appropriate teaching and learning strategies, and appropriate learning activities to meet student needs.

Short term planning documents should contain:

- w Clear learning intentions with activities drawn from the medium term planning, as appropriate.
- w Differentiation by task, outcome, adult or resource support. Evidence of differentiation across a minimum of three ability levels should be evident in most lessons, as appropriate.
- w Plans for adult input (teacher or CA) for group work.
- w Identification of key resources.
- w Plans for assessment of the learning intention(s) that are used to inform future planning.
- w Clearly structured lessons that follow the models presented by the IEA CPD.
- w Evaluation and next steps for planning.

Assessment

As noted in the previous section, assessment must be thoroughly planned and integrated with the teaching process. Once again, a number of guidelines for assessment are included within each curriculum area's documentation. However, just as for planning, there are some basic approaches and beliefs which underpin all assessment in IEA schools.

The first important distinction is between *formative* and *summative* assessment. While both forms have their place, formative is the most vital since without it teachers cannot respond to student learning needs in a timely fashion.

Summative assessment …

- w   is useful in monitoring progress towards benchmarks

- w   confirms accuracy of formative assessment

- w   contributes to the evaluation of learning and achievement

Formative assessment …

- w   is on-going assessment

- w   is integrated into daily teaching and learning

- w   is used for progress monitoring

- w   drives the use of instructional groups

- w   can be used to adjust teaching and learning and short term planning 'in the moment'.

Formative assessment involves the teacher, the student and other students in making judgements, improving planning and providing feedback, as the following table of roles shows. Assessment allows us to determine where a student is, where they need to be, and how best to get there.

	Where the learner is going	Where the learner is right now	How to get there
Teacher	Clarifying, sharing and understanding learning intentions and success criteria.	Engineering effective classroom discussions, activities, and tasks that elicit evidence of learning	Providing feedback that moves learning forward
Peer student		Activating themselves as instructional resources for one another	
Student		Activating self as the owner of their own learning	

Adapted from Leahy, Lyon, Thompson & Wiliam, 2005

Glossary

Assessment	The gathering of evidence (data) about student performance that constitutes a valid and reliable indication that the student has achieved identified learning outcomes. The close connection between this and *evaluation* often leads the two words to be used interchangeably to mean the full process of assessment and evaluation.
Authentic assessment	Assessment of learner performance that is as closely related to a real life situation as possible and is not artificial or contrived. One way to make an assessment more authentic is to have learners choose the particular task they will use to demonstrate what they have learned. Authentic assessment involves the collection of information from a rich range of sources, including, importantly, the individual. Portfolios, checklists, work samples, diaries, permanent products, pencil-and-paper tests, observations and other forms of assessment may shed light on what the learner knows or is able to demonstrate, and the direction(s) required in one's learning program.
Collaborative learning	A process through which learners at various performance levels work together in small groups toward a common goal. It is a learner-centred approach derived from social learning theories as well as the socio-constructivist perspective on learning. Collaborative learning is a relationship among learners that fosters positive interdependence, individual accountability, and interpersonal skills. For collaborative learning to be effective, teaching must be viewed as a process of developing and enhancing students' ability to learn. The instructor's role is not to transmit information, but to serve as a facilitator for learning. This involves creating and managing meaningful learning experiences and stimulating learners' thinking through real-world problems. Yet, the task must be clearly defined and be guided by specific objectives. Sometimes cooperative and collaborative learning are used interchangeably but cooperative work usually involves dividing work among the team members, whilst collaborative work means all the team members tackle the problems together in a coordinated effort.
Curriculum area	An organising structure for the broad curriculum. Three curriculum areas have been identified for IEA schools: English, Mathematics and Inquiry. The Inquiry area embraces the traditional subjects of Society and Environment, Science, Technology, The Arts, and Physical Education, Health and Personal Development. IEA curriculum areas are divided into curriculum strands.
Curriculum differentiation	The process of adapting the curriculum according to the different ability levels of the learners in the classroom so as to provide meaningful learning experiences for all. Differentiation takes account of learner differences and matches curriculum content and teaching and assessment methods to learner needs and characteristics. It is the key strategy for dealing with a range of ability or previous achievement levels in the class.
Data	All the information the school can collect about the student including performance in assessment tasks, details about personal background, behaviour, likes and dislikes, interpersonal experiences and much more. Teachers can use this information to determine the 'what and how' of each student's future learning. Data may be qualitative or quantitative.

Deep understanding	**Describes the stage of learning where students can use their knowledge base to develop strong underlying concepts. This allows them to make connections, form generalisations, solve problems and develop new ideas. They can solve real-world problems and use the knowledge in different contexts. Students can apply, explain and evaluate their thinking.**
Designing down	**The process of unpacking a broad outcome into smaller component outcomes. For example, key outcomes are unpacked to create level outcomes, which are in turn designed down to contributing outcomes.**
Diagnostic assessment	**Assessment aimed at identifying a learner's strengths and weaknesses to inform future planning and determine readiness.**
Differentiated instruction	**An approach to teaching that involves offering several different learning experiences and addressing students' varied needs to maximize learning opportunities for each student in the classroom. It requires teachers to be flexible in their approach and adjust the curriculum and presentation of information to learners of different abilities.**
Evaluation	**The making of decisions based on a set of student performance data. See also assessment.**
Formative assessment	**Assessment conducted throughout the educational process with a view to enhancing student learning. It implies: eliciting evidence about learning to close the gap between current and desired performance (so that action can be taken to close the gap); providing feedback to students; and involving students in the assessment and learning process.**
Growth mindset	**The belief that understandings and skills can always be developed further. This term contrasts with 'fixed mindset' in which a person believes there is a fixed limit to what can be learnt.**
Inquiry learning	**Inquiry learning is an active thinking and learning process. It is essentially a student-centred learning approach in which the learner is actively involved in the process. It is based on the belief that students must be actively engaged in the process of investigating, processing, organising, synthesising, refining and extending their knowledge within a topic. Inquiry learning encourages learners to form concepts and generalisations instead of being told simple answers to more complex questions.**
Key outcome	**Outcomes written at the highest possible layer, defining the ultimate achievements of all students who complete their education in IEA schools. It should be possible to see a link between all outcomes written at other layers and the system's key outcomes. Key outcomes for the IEA system are included in the curriculum core document.**
Level	**A broad tier of student achievement. IEA curriculum documents outline outcomes at 5 achievement levels which cover the first nine years of schooling. Only a proportion of students will achieve Level 5 outcomes by the end of Grade 8. Students pass through levels at widely differing rates.**
Metacognition	**Being aware of and understanding our personal thinking processes. This is a fundamental skill which needs to be developed for learning to flourish.**

Moderation (in assessment)	**The process of establishing comparable standards for evaluating learners' responses to assessment tasks across several classes or time periods. It involves groups of teachers looking at examples of student work, discussing the extent to which these meet the expected outcome, and coming to an agreement on the level of attainment represented by each example**
Norm-referenced assessment	**Assessment of learner's progress and achievement with reference to the levels of achievement of his/her peer group and/or by reference to norms derived from a sample of a similar population.**
Pedagogy	**The art and science of teaching, as a professional practice and as a field of academic study. It encompasses not only the practical application of teaching but also curriculum issues and the body of theory relating to how and why learning takes place.**
Perspective	**An aspect of the curriculum which pervades all curriculum areas. Examples referred to in this curriculum are *PNG context*, *equity*, and *international standpoints*. Schools are required to provide these perspectives to the implementation of all curriculum areas.**
Problem solving	**A process that allows the learner to take steps to solve problems of varying magnitude**
Qualitative	**Used to describe data which can't actually be measured. In general, it is data which has validity because it is the view of an 'expert' – in most cases the classroom teacher. For example, the level of interest shown by a parent in their child's education, the interpersonal skills of a student, a teacher's overall perception of the quality of a piece of writing.**
Quantitative	**Used to describe data which can be represented numerically. For example, a score out of 20, a percentage, a reading age in years and months or a reading level.**
Rubric	**A scoring tool containing performance criteria and a performance scale with all score points described and defined. Rubrics are specific guidelines with criteria to evaluate the quality of learner work, usually on a point scale. Learners may use rubrics to judge their own work, and to edit and improve it.**
Self-efficacy	**One's belief in their ability to learn and to achieve their goals**
Spiral curriculum	**Curriculum design (based on The ideas of the American psychologist Jerome Bruner) in which key concepts and topics are repeatedly presented over time in the context of new, broader and more complex learning experiences. It serves for consolidating pre- existent learning as well as broadening and exploring more in-depth the different learning content.**
Standardized testing	**Tests that are administered and scored under uniform (standardized) conditions. See also 'Norm-referenced assessment'.**

Validity (in assessment)	Refers to what is assessed and how well this corresponds with the behaviour or construct to be assessed. In the case of 'site validity' it involves assessments that intend to assess the range of skills and knowledge that have been made available to learners in the classroom context or site. High 'system validity' involves assessments that intend to assess an often narrower range of skills and knowledge, deemed essential by the particular government body or system. Current validity theorising incorporates concerns about fairness and bias, and reflects similar understandings of the social basis of assessment. Validity is not simply the way in which a test functions, but depends on what it is used for and the interpretation and social consequences of the results. Thus, an essential part of validity is the concern with whether the inferences made from the results of an assessment are fair to all those who were assessed.

Some of the entries in this glossary are based on the much more detailed *Glossary of Curriculum Terminology* published by UNESCO International Bureau of Education, Geneva, 2013. Available online at

http://www.ibe.unesco.org/fileadmin/user_upload/Publications/IBE_GlossaryCurriculum Terminology2013_eng.pdf