

Design and present an academic poster applying theoretical models of cross curricular teaching to the incorporation of literacy, numeracy and digital competence as cross curricular responsibilities.

THEME BASED APPROACH

“Theme based approaches use a theme to generate exploration through the eyes of several different subjects” (Barnes, 2015; 69). A thematic approach to teaching and learning is a method often seen in the classroom, usually with classrooms having one theme to run through one term at a time.

BENEFITS TO THIS APPROACH ARE:

- * Learning becomes more engaging and fun to teach
- * Pupils see links and connections between subjects under an over arching theme.
- * Engages curiosity and motivation to learn
- * Teachers become the facilitators of learning
- * Pupils can relate to ‘real life’ situations.
- * “Broadly conceived according to developmental principles rather than designed to achieve narrowly defined, fragmentary skills” (Berry, 1993;3)

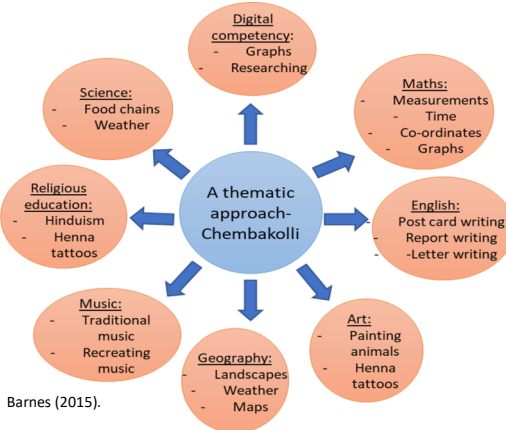
LIMITATIONS TO THIS APPROACH ARE:

- * Teachers need superior knowledge of a wide range of subjects
- * Themes can become boring and used for too long.
- * Limitation on resources to achieve the different areas of learning.
- * Links can be tenuous and aims are unclear (Barnes, 2015; 69).
- * Subjects that don’t link into the theme are absent from the learning (Barnes, 2015; 70)

The diagram below presents the different topics and skills taught through the theme. These lessons will run through a term with the enriched lessons building on a variety of different skills throughout the whole curriculum.

Numeracy, Literacy and Digital Competency are present in a variety of different topics and enhance other areas of learning. For instance, the skills learnt in the graph lesson in Maths are connected to looking at the rainfall in Geography which falls under the weather topic, This allows the pupils to learn how to “extract and interpret information from an increasing range of diagrams, timetables and graphs” (WAG, 2014). Pupils will use digital competency as online research will be undertaken for the data by the pupils and they will create a graph to present their findings. Literacy is then enhanced through writing up a conclusion including mathematical language which also interlinks with the element ‘locating, selecting and using information’ and ‘represent and communicate’ in the Literacy numeracy framework (see tables 1 and 2).

The three tables below show the curriculum content covered through the term in numeracy, literacy and digital competency (see tables 1, 2, 3). However, it isn’t only these lessons that are present cross curricular, as shown in the diagram, every lessons links into another.



Barnes (2015).

Strand	Element	What the learners have learnt
Numerical reasoning	Identify processes and connections	transfer mathematical skills to a variety of contexts and everyday situations
		select appropriate mathematics and techniques to use
		select and use suitable instruments and units of measurement
Using measuring skills	Represent and communicate	explain results and procedures clearly using mathematical language
		select and construct appropriate charts, diagrams and graphs with suitable scales.
	Temperature	measure and record temperatures involving positive and negative readings
Using algebra skills		calculate temperature differences, including those involving temperature rise and fall across 0°C
	Functions and graphs	read, plot and write coordinates in one quadrant, e.g. (2, 4)
		represent data using— lists, tally charts, tables, diagrams and frequency tables— bar charts, grouped data charts, line graphs and conversion graphs
Using data skills	Collect and record data	extract and interpret information from an increasing range of diagrams, timetables and graphs (including pie charts)
	Present and analyse data	
	Interpret results	
Numerical reasoning	Represent and communicate	explain results and procedures clearly using mathematical language
		select and construct appropriate charts, diagrams and graphs with suitable scales.
		use coordinates to specify location.
Using measuring skills	Area and volume, angle and position	
Using measuring skills	Time	read and use analogue and digital clocks

Table 1 Numeracy, LNF. (WAG, 2013)

“Cross curricular learning occurs when the skills, knowledge and attitudes of a number of different disciplines are applied to a single theme, problem, idea or experience “ (Barnes, 2015; 62).

The approaches and lessons are suitable for a Year 5 class and link into the Year 5 skills and elements from the curriculum.

Through the curriculum numeracy and literacy have been interrogated through different aspects of learning, not only in their boxed subject. These subjects were considered dominating skills needed and became statutory requirement in the curriculum in 2013 when the literacy, numeracy framework (LNF) was created. It is a ‘curriculum planning tool’ (WAG, 2013; 7) to provide opportunities in lessons for pupils to apply skills and knowledge of these areas in different contexts. These skills then become “activity and experience rather than knowledge to be acquired and facts to be stored” (UK Board of Education, 1931; para. 75) and pupils see a sense of purpose in learning these skills outside of the classroom.

Along side numeracy and literacy, digital competency has become a core skill in education and being integrated to “developing digital skills which can be applied to a wide range of subjects and scenarios that are transferable to the world of work. (WAG, 2018;2).

Strand	Element	Learners are able to:
Oracy across the curriculum	Developing and presenting information and ideas	explain information and ideas, exploring and using ways to be convincing, e.g. use of vocabulary, gesture, visual aids
	Reading across the curriculum	use a range of strategies to make meaning from words and sentences, including knowledge of phonics, word roots, word families, syntax, text organisation and prior knowledge of context
		identify how punctuation relates to sentence structure and how meaning is constructed in complex sentences
Reading across the curriculum (Comprehension)	Responding to what has been read	scan to find specific details using graphic and textual organisers, e.g. sub-headings, diagrams
		identify features of texts, e.g. introduction to topic, sequence, illustrations, degree of formality
		show understanding of main ideas and significant details in texts, e.g. mindmapping showing hierarchy of ideas, flowchart identifying a process
Writing across the curriculum	Organising ideas and information	identify and explore ideas and information that interest them
		write with a clear purpose, showing consideration for the reader, e.g. by choosing appropriate vocabulary and presentational devices
		use techniques in planning writing, e.g. mindmapping, sequencing, placemat activities
	Writing accurately	use features which show the structure of the writing, e.g. sub-headings, captions
		write an introduction that establishes context, a series of appropriately ordered points and a suitable conclusion
		use paragraphs, which have a main idea and related details
		use language appropriate to writing, including standard forms of English
		use appropriate vocabulary, including subject-specific words and phrases.
		use different sentence structures, including complex sentences showing relationships of time, or cause, e.g. before you start ... , if you do this then ...
		use the full range of punctuation to guide the reader in complex sentences, e.g. commas, bullet points, speech marks and apostrophes for possession

Table 2 Literacy, LNF. (WAG, 2013)



Chong (2010)



Smith (2016)

OPPORTUNISTIC APPROACH

“Opportunistic cross curricular teaching allows children to dictate the depth and direction of learning in subject categories arising from a shared theme or experience” (Barnes, 2015; 75). An opportunistic approach to teaching and learning heavily depends on the pupils’ voice, opinions and interests. Dewey, stated “I believe that the only true education comes through the stimulation of the child’s powers by the demands of the social situations in which he finds himself” (1897; 77-80).

BENEFITS TO THIS APPROACH ARE:

- * It is highly motivating and engaging.
- * Pupils dictate the learning.
- * Learning “arises from any open and enquiring interaction with the world” (Barnes, 2015; 75).
- * Behaviour and well being are improved through pupil engagement (WAG, 2011;2)
- * Pupils are supported and encouraged to participate (WAG, 2011; 2)

LIMITATIONS TO THIS APPROACH ARE:

- * Learning can get lost and become meaningless.
- * Teachers need superior subject knowledge on a wide range of subjects and topics.
- * Lessons can be unpredictable, include elements of risk and are hard to plan (Barnes; 2015;76).
- * Teachers need confidence in teaching in this approach.
- * Lessons may last over a long time period but little skills are being practised.

The diagram below demonstrates the different topics and skills taught through this approach. The topics are decided by the pupils in the classroom, however there will be one over arching theme to allow the children to know what to base their ideas and lessons around. This theme will run through a term with literacy, numeracy and digital competency supporting each lesson.

Examples of how numeracy, literacy and digital competency interlink with the topics stated in the diagram below are: Literacy can be included in history by writing a letter as a time traveller from a time period they have decided to visit, they will use descriptive writing along with historical key words and different tenses to show whether they are discussing life in the present or past. This allows the learner to “use a range of strategies to make meaning from words and sentences” including “text organisations prior knowledge of context” (WAG, 2014) (see table 2 for further curriculum context).

Numeracy will be enhanced in geography through coordinates and map work where the pupils will need to find places on a map using coordinates or find coordinates for places on these maps. The learners will learn to “use coordinates to specify location” (WAG, 2014) (see table 1 for further curriculum context).

Digital competency and science work well together where pupils can use VR sets and greenscreens to be able to ‘visit’ the solar system, other planets or places in the past. They will also use their skills to be able to research about their solar system and write up a report (see table 1,2, and 3 for further curriculum coverage).

There are a number of different numeracy, literacy and digital competency skills in the curriculum enhanced from teaching this approach cross curricular (see table 1, 2, 3).

Strand	Element	Learners are able to:
Citizenship	Digital rights, licensing and ownership	cite all sources when researching and explain the importance of this, e.g. create simple lists for the referencing of digital and offline sources; discuss rights and permissions associated with this
Interacting and collaborating	Storing and sharing	back up files to a second or third storage device, e.g. removable storage device, network drive (locally or online)
Producing		Search for a specific file
	Planning, sourcing and searching	adjust keywords and search techniques to find relevant information; begin to reference sources used in their work; consider if the content is reliable, e.g. find information using accurate terms, use a range of sources to check validity and understand the impact of incorrect information.
	Creating	combine a range of multimedia components to produce an appropriate outcome
Producing		create, collect and combine a range of text, image, sound, animation and video for selected purposes
	Evaluating and improving	explain reasons for layout and content of own work, e.g. evaluate the presentation for audience and appropriateness
	Data and information literacy	create, explore and analyse data sets, highlighting relationships within them, e.g. using spreadsheets, databases, tables and charts.

Table 3 Digital competency, (WAG, 2013)



Barnes (2015)