PERSONALISED SEARCH TOOL FOR TEACHERS – PoSTech!

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ABSTRACT

One of the ways in which teachers tend to 'personalise' to the needs of their students is by complementing their teaching materials with online resources. However, the current online resources are designed in such a way that only allows teachers to customise their search and not personalise. Therefore, a Personalised Search Tool *for teachers called the "PoSTech" has been proposed for the iClass Project (EU funded) This paper will outline the functionality and the possible interface of such a tool designed in correspondence to the IEEE LOM standards.*

Keywords: Cross-Curricular, Differentiation, Project Based Learning, Metadata, Pedagogical Vocabulary, Personalisation, Online Search, IEEE LOM

1. INTRODUCTION

One need which teachers have, as confirmed by our empirical research, is to use natural pedagogical vocabulary when conducting searches for resources. For example, when authoring a set of resources for students, the teacher may need to use search criteria which naturally appear in teachers' thinking but which do not explicitly appear in the content or metadata of a relevant resource.

Our empirical research indicates that there is a gap between teachers' pedagogical vocabulary and the content/metadata of resource, which occurs generally and leads to low levels of trust and acceptance among teachers (both experienced and novice) using online search. It is felt that 'there is a lot of good stuff out there' but 'it is hard for me to locate what I need'. That is: it is felt that the criteria which teachers actually use, and have to use, can be hard to communicate to a search engine.

Therefore, to support and aid teachers with their online search a personalised search tool has been proposed for the iClass project (iClass project is funded under the FP6, the European Community Framework Programme for Research, Technological Development and Demonstration. It has 22 partners from 11 different countries and a budget of 9 millions Euro and the project is expected to finish by the year 2010).

The main purpose of the tool will be to translate search criteria expressed in teachers' pedagogical vocabulary to searches on existing metadata fields, in correspondence to the IEEE LOM standards.

To investigate and identify teacher's needs, an interview and a questionnaire survey was conducted among three groups of teachers:

- Most recent winners of the National Teachers Award.
- Teachers at Sacred Heart High School, Hammersmith (secondary teachers)
- Teacher trainees at the University of London, Institute of Education (primary and secondary)

From the research two main conclusions were drawn:

1. Cross curricula, Differentiation and Project-based learning are considered to have a significant impact on the students learning, thus it is important for teachers to facilitate this need through searching online for the relevant resources.
2. There is a lack of personalised resources available to teachers when searching for teaching resources.

The findings from the above empirical research are discussed in detail in the following sections.

2. Interdisciplinary/Cross-Curricular

Interdisciplinary/cross-curricular teaching is defined as "a conscious effort to apply knowledge, principles, and/or values to more than one academic discipline simultaneously. The disciplines may be related through a central theme, issue, problem, process, topic, or experience (Jacobs, 1989)".(Education Place, 1991c)

By implementing cross-curricular teaching students can apply, integrate and transfer knowledge. It is also a way to increase students' motivation in their learning and thus Improving learning. (Education Place, 1991b)

The organizational structure of cross-curricular teaching is also referred to as a theme, thematic unit, or unit. "Thematic unit consist of a series of learning experiences that are focused on a particular topic, idea, author, or genre; each unit consists of specific learning or literacy outcomes for students. Several pieces of literature that support the theme becomes the basis for major reading and writing experiences within the theme."(Education Place, 1991a)

2.1. The advantages of using themes are as followed:

A. Learning About Text Structure Across Selections; Thematic organization makes it possible to arrange several pieces of related literature together to help students learn to use different text structures as aids to constructing meaning.

B. Strategies/Skills Evolve from the Literature; By encountering several related pieces of literature, students get repeated modelling and practice with the same types of strategies and skills.

C. Building Connections and Relationships; Thematic organization helps to account for the concepts of schema theory and prior knowledge.

D. Provides Models for Reading and Writing; a thematic organization allows reading and writing to be taught and developed together as readers and writers naturally learn.

E. Efficient Use of Classroom Time; by having a strong thematic organization, teachers are better able to provide students with learning experiences that make more efficient use of their time and match the way students actually learn.

F. Supports Constructing Meaning; by having focused themes is that they make it possible for students to more effectively construct meaning by reading related authentic selections and building connections among them.

(Education Place, 1991a)

2.2 What the best national teachers say about cross curricula?

According to Ms Sue Seafield, ("Lifetime Achievement Award") the government in the UK encourages and supports "Cross Curricula" teaching in the Primary Sector. This is where one topic is selected and used as a guideline to plan and prepare individual lesson plans across the whole national curriculum, with the aim of achieving the national standards, set by the government.

Therefore, primary teachers need to comply with the "Cross Curricula" specifications, in terms of both designing and/collecting cross curricula materials to teach in their classrooms.

"The government are saying to us come away from the syllabus which I am very delighted with. We are now moving on to TOPIC work, which I started teaching. Therefore we are working on cross curricula".

Ms Sue Seafield

"Cross Curricula" encourages students to draw on a wide range of information and subject, they excel in more and offer more input. It allows links to be made."

Ms Pam Roberts

To fulfil these needs, primary teachers tend to search the Internet as their first choice of resource. However, due to the fact that there is a lack of "Cross Curricula" materials online, teachers are left with the huge task of identifying and organising materials. For example, on the topic of the World War II, primary teachers would have to conduct a thorough search on the subject of World War II, which

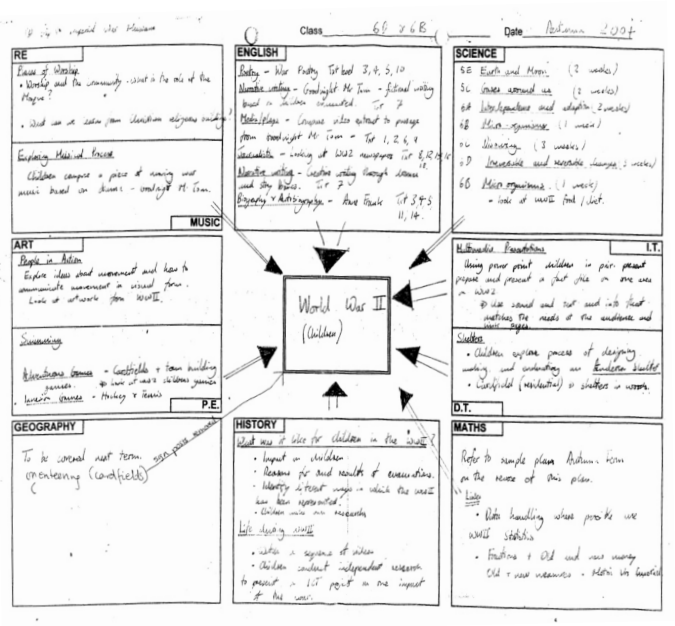
would then need to be carefully reorganised and modified to support other relevant subjects such as Maths, English, Science, Music, P.E., History, Geography and D.T. (design & Technology)

"We usually use the Internet to go and look up the information we want. So we access the Internet through whiteboards (we've got 16 and that includes the nursery). We have programmes for literacy and numeracy. What I don't think any one has come up with is basically CROSS CURRICULA work, using the computer <online search> to really support cross curricula work and developing programmes which would have everything in it. So if you were doing a topic on History, it would say, here is your history project. Moreover, it would say, here is your geography, that would be the literacy you can get from it, and this is the numeracy, science and the art < in other words it will give you> all the things you can do with that topic, these are cross curricula, no one has done that."
Ms Sue Seafield, primary headmistress

(F.Seyedarabi, 2005)

2.3. Examples

Below is an example on cross-curricula, from Ms Sue Seafield's school.



3. Differentiation

Differentiation is defined as the "adjustment of the teaching process according to the learning needs of the pupils", which can be used to aimed at:

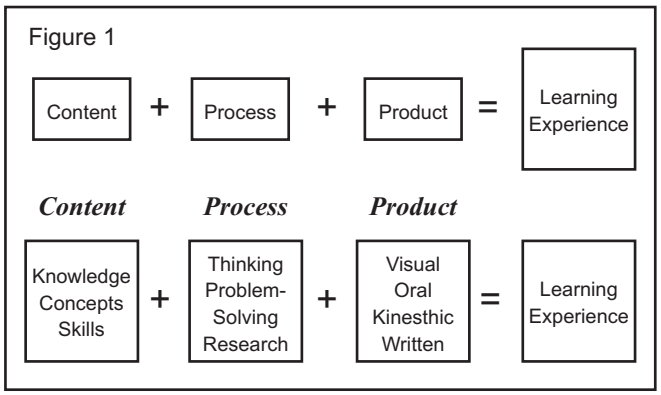
- A whole class
- Groups within the class
- Individuals

(Greenfield School Community & Arts College, 2005)

"Students have different learning needs as they tend to have different Prior knowledge, Prior experiences, Culturally defined values and norms, Biological differences in cognitive development, Home environment, Maturity level, Self-efficacy and Culturally determined perceptions of school and learning and thus teachers should take these into account when choosing planning their lessons".(Educational Studies St. Mary's College of Maryland, 2005b)

"Teachers have an obligation to give every student an opportunity to learn and succeed. This cannot be achieved by providing the exact same learning experiences for everyone. Every person has a different approach to learning. Educators can take these differences into account in a fair way by using differentiated instruction".(Educational Studies St. Mary's College of Maryland, 2005c)

Teachers can apply differentiation in three ways: by content (what is being taught), by process (how it is being taught) and by product (tangible results produced based on students' interests and abilities). Please see Roberts and Roberts (Roberts, 2001), Figure 1.



3.1 Benefits of a Differentiated Classroom are as followed:

Student Benefits

- *Every student has an opportunity to succeed. A single experience with success is enough for a student to approach new learning situations with confidence and motivation (Stronck, 1980).*
- *Opportunity to discover personal strengths and show multiple intelligences.*
- *Less frustration due to confusion or boredom.*

Benefits to the Teacher

- *More sense of control over each student's learning progress (Tomlinson, 1995).*
- *A greater understanding of each student's ability to learn.*
- *The reward of having a classroom that allows equal opportunity for success for all students.*

(Educational Studies St. Mary's College of Maryland, 2005a)

It is also believed that assessment is an essential part of differentiation (Differentiating instruction starts with a strong understanding of students). Therefore, teachers should know their individual student's educational strengths and weaknesses, learning style and interest. For example, the following tools can be used to implement differentiation: (Greenfield School Community & Arts College, 2005)

- Multiple Intelligences
  (i.e. Multiple Intelligences Inventory and Learning Disabilities Resource Community's Multiple Intelligence Inventory)
- Learning Styles/ Personality Inventories
  (i.e. Abiator's Online Learning Style Inventory and LD Pride's Learning Styles Self-assessment)
- NWEA MAP
  (Use the Teacher Report, the Class by RIT Report and Class Reports to help group students for instruction)
- Lexile
  Knowing student Lexiles will help to choose books for them to read. The Lexile framework for reading site has a tool that will enable the teacher to find the Lexile rating on most books.
- Hot Potatoes
  The Hot Potatoes suite includes six applications, enabling teachers to create interactive multiple-choice, short-answer, jumbled-sentence, crossword, matching/ordering and gap-fill exercises for the World Wide Web. Hot Potatoes is not freeware, but it is free of charge for those working for publicly-funded non-profit-making educational institutions, who make their pages available on the web.

3.2 What the best national teacher say about differentiation?

Secondary teachers tend to adapt to their students' needs by referring to their "Baseline-data" (please see appendix B). The baseline data is designed to include information about individual students in terms of their Background (ethnicity, gender, first language and so forth), Ability: i.e. individual Capabilities (SATS Score) and whether the student is "Talented" (this means that they display special attitude in either art, drama, PE and music) and or "Gifted" (this is when a student has superior intellectual abilities, together with other information such as the students' level of education (main scale or special educational need or whether English is considered to be their second language).

From Mr Beadle's interview, we have learnt that teachers tend to use popular search engines i.e. Google search image to find visual stimuli to show their students which is considered to be a reasonably good search engine/resource as it allows the individual teacher to have the "chaos factor of being a teacher", (that is being able to find other relevant and useful

materials which was not originally planned by the teacher but was a result of pure chance).

However, teachers do not treat search engines as their main resource repository since it cannot offer differentiated materials. The ideal adaptive search was defined as one, which supports and provides differentiated materials to teachers.

"If you could make a piece of software which would automatically produce differentiated materials in a subject, then you've got a real winner. Say I have a student who is at the early stages of literacy and I am teaching a lesson on one subject. So if I put <type> in the subject <in the search engine> it would produce me differentiated materials for students who can't read and write English (by proving the teacher with easier worksheets) so that they could actually be involved in the lesson. Then that would be a real winner. So it will produce easy work words, closed procedures, something that they would be happy to create." Mr Beadle, secondary teacher

(F.Seyedarabi, 2005)

3.3. Examples

According to our empirical research, we have learnt from Mr beadle that it is essential for him to find differentiated resources in order to personalise his teaching for his students, whom are categorised under different groups as they have different abilities and learning needs:

- Gifted; "when a student have high intelligence or aptitude" (Gifted and talented students meeting their needs in New Zealand schools, 2005) and /or
- Talented; "when a student have high level of performance in areas like music, art, craft, dance, or sport" (Gifted and talented students meeting their needs in New Zealand schools, 2005),
- Mainscale
- SEN (special educational needs) and
- ESL (English as their second language).

He agues that *"whilst there are differentiated materials, often these are not specific to the status of the student. For instance, if I am studying a specific poem written by Simon Armitage, then I should like access to materials for:*

1. SEN - non-literate students
2. Students working at levels 1 & 2
3. Students working at level 3
4. Non English speakers
5. EAL students at EAL stage 2 (fairly early stage of language acquisition."

4. Project Based Learning (PBL)

Project based learning is used as a model of teaching, where an in-depth study and investigation of a real world topic or problem is carried out by students.

Project based learning is also called Problem-Based, Inquiry Based, Project Oriented, or the Project Approach. Where "students use knowledge from several disciplines to develop realistic products. Teachers use the "constructivist" approach by allowing the students to construct their own knowledge as they work. A key characteristic of project-based learning is that the project does not focus on learning about something. It focuses on doing something.

4.1. By using PBL the following can be achieved:

1. Students become naturally motivated because they feel that the project is meaningful.
2. The project actively engages all students.
3. Students feel ownership of project.
4. Students enjoy learning as they are given the opportunity to "construct" their own knowledge as they develop their project.
5. Develops teamwork.
6. Improves higher order thinking skills.
7. Students focus on an end project (goal oriented).
8. Students enjoy learning.
9. Students learn through failure as well as success.
10. Raise student achievement.

(Instructional Technology)

4.2. What the best national teacher say about PBL?

Project-based learning is considered to be the best way of achieving personalisation/assessment at both the

primary and perhaps more at secondary level. *"If I design a system, one of the best ways I think personalisation can happen or assessment can happen is through project based learning, that's for teachers now and really for the next ten years. You will see that e-learning at the moment is very disjointed. There is no integrated project, which will meet in each curriculum area, that's the value added curriculum, so if you can develop something like that, that is going to be very powerful. An example would be to design a project for my students (aged 12yrs or 16yrs) to do a journey from here to South Africa where I would ask them to develop an itinerary of how they'd actually do that travel."* **Dr. Singh**, Secondary Teacher

There are many online resources available to teachers i.e. BBC and Google. However, the materials are not personalized for each teacher and thus, teachers are forced to use a set of online materials over and over again.

"At the moment most of the teachers are exposed to the BBC site or Google, and I feel that there are a lot of applications, some teachers do this but next year another teacher will be using the same resources and maybe if there was a system like yours <iClass> we could say that hold on, lets go to that as our first portal."

Dr. Singh, Secondary Teacher

Moreover, to personalise their teaching materials, teachers have to take the long and uncertain journey of searching other sites in order to bring relevant pieces together to create their personalised teaching material.

We've got a lot of resources electronically but it's all over the place. At the moment we need to pull it together. Any system which would allow us to do that, and I think that what's needed is to have the conversion systems coming to one place and I think that's the challenge for us and I feel that's where we are." **Dr. Singh**, Secondary Teacher

The main problem with the current search engines from the teachers' prospective is that the current online resources are vast, time-consuming and above all do not reflect on the needs of teachers in particular. For teachers, the best online search engine is regarded as one that reflects specifically on teachers' needs and their individual preferences together with additional features like printable worksheets.

"I think with Google, what I would love is an extra educational bar. Extra button, which would reflect on me more as a teacher. There is nothing like that for a teacher at Google. At the moment it is too cluttered (untidy), you can find them but it's like a big journey to get to there. I think at the moment there are a lot of teaching but no resource to give to the kids. That's the most important thing. What we want is a button, which says print resource sheet, which you can use within the lesson. There should be a huge button saying print worksheet, it's too complicated."

Dr. Singh, Secondary Teacher (F.Seyedarabi, 2005)

4.3. Examples

For some examples on project-based learning please visit http://www.projectapproach.com/examples/projects.htm

4.4. Teacher's Needs

From the above data it can be concluded that Cross curricula, Differentiation and Project-based learning are considered to have a significant impact on the students learning, thus it is important for teachers to facilitate this need through searching online for the relevant resources.

5. What practitioners say about online searching at the Sacred Heart High School (secondary School)?

In order to further investigate and identify other possible functionalities needed by teachers when searching online, we have asked ten teachers at the Scared Heart School in Hammersmith (secondary school) to participate in our questionnaire survey, teachers' practice of online searching.

5.1. Online searching: features or characteristics

In response to the question "when searching online for your teaching materials, what features or characteristics do you dislike?" they complained about the lack of personalised resources available to teachers. Please see below for a selection of teachers' comments on online searching:

- "Often worksheets provided are inappropriate to my objectives".
- "Not detailed/too detailed, slightly wrong syllabus".
- "Good ideas married by poor/very small illustration; verbose, text; being in an un-editable format e.g. flash file; having too much text on a page; very long pages; pages with no navigation back to home".
- "Some words associated with non-scientific concepts turn up in common phrases so I find it difficult to pick out the scientific links, e.g. streamlining- hard to screen out sites about improving business efficiency, acceleration which is associated with rate of change in business world".

5.2. Online Searching: ideal search

Furthermore, teachers' ideal search was described as one where search results are personalised according to the national curriculum, student's abilities/levels, and teachers' objective, together with having a filtering system in order to eliminate unrelated and duplicated resources/links. Please see below teachers' comments on their ideal search:

- "Provide text in easy to access form and images, videos, audios all listed under these categories". Teacher A
- "Give it the outcome of the lesson/activity and the syllabus name and it would come up with differentiated worksheets, activities, practical, assessment or visuals". Teacher B
- "Screen out pages with more than 2 screen of the text and no illustration. Remove multiple links to the same site. Screen out, out of context websites like university courses, business, papers etc". Teacher C
- "To only offer me a handful of resources that are UK curriculum linked and levelled/graded". Teacher D
- "Have ready-made lessons for all abilities". Teacher E
- "Suggests starts activities, link to relevant activities, extension materials for pupils at home". Teacher F
- "Has different categories for when searching (like Google) e.g.

  Where you just type in topic, subject, key stage and then which part you want". Teacher G
- "Provide Thom brads of images/diagrams rather than just web addresses". Teacher H
- "Find the exact topic with examples of activities online and worksheets, along with presentational materials". Teacher I
- "Very extensive word search with subject specific levels graded by people who visit the search engine". Teacher J

6 What the PGCE students at IoE say about their experience with online searching?

To further expand our survey among teachers we have asked 99 student teachers (PGCE) at University of London, Institute of Education, to participate in our questionnaire survey, looking at teachers' practice of online searching.

The teacher students are selected from three different disciplines: primary, secondary and post-compulsory level.

6.1. Online searching: features or characteristics

In response to the question "when searching online for your teaching materials, what features or characteristics do you dislike?" they complained about the lack of personalised online resources (subject area and time), out-dated/not up-to-date resources and the long and tedious process of searching. Please see below for a selection of teachers' comments on online searching:

- "Looking through loads of websites not finding what I'm looking for".
- "Having to register, misleading links that takes you to order forms for books".
- "Not enough material for my subject area and time".
- "Finding relevant info can be hard".
- "Always have to adapt material to suit the purpose".
- "It is hard to find good stuff".
- "Sitting through useless information".
- "Sometimes-number of things not relevant to your search come up".
- "Quality and writing".
- "Superfluous information".
- "I am not looking for pre-prepared objects. There are various worksheets etc. for history on the web, most of which fortes 'activity -led' teaching, not progression in historical understanding. I prefer to make my own objectives".

6.2. Online Searching: ideal search

Teachers' ideal search was described as one where search results were personalised according to the national curriculum, key stage/age group, topic and subject together with the availability of the relevant printable worksheets and possibly homework for them to use in their classes. Please see below for a selection of teachers' comments on their ideal search:

- "A search engine that is curriculum based so that results are narrowed and focused and relevant for the age phase".
- "Relevant to age-phase (early years), printable and topic based with suggestions for differentiation and assessment".
- "Subject - key stage - worksheets-cross curricular links".
- "Provide lessons ideas relevant to the necessary topic".
- "Worksheet, pictures, lesson plans".
- "Printable worksheets, learning interactions, lesson plans, cross-curricula links".
- "Be specific and show results for key stage, year group and maybe say if there's a lesson plan and worksheets attached".
- "Find the subject, year and relevant links to the national curriculum".
- "Find worksheets and interactive, teaching tools e.g. PowerPoint displays or multimedia clips about my topic, curriculum (KS3 strategy) and for my age range (5-7yrs). As well as being able to store them, put a tap on it".
- "Find ten exact materials for the specific word I type; up to date research and activities (timed)".
- "Find relevant worksheets to certain projects within the KS3 strategy".
- "Find the particular topic with explanations and relevant worksheets with differentiation for different levels".
- "It would be nice to have a search engine which has lesson plans and relevant worksheets for each year group".
- "Examples of work below/above average e.g. for year 3 – year 4.
- "Give questionnaires and imagery".
- "Have printable worksheets of all aspects of the curriculum".
- "Free".
- "More refined search that is easy to use".
- "Easy, user friendly tools to import images/text onto documents".
- "Focus on your specific syllabus and specification; on age group you are teaching".
- "Provide access to printable and adaptable resources".
- "Would be nice to separate key stages (don't like having to shift through lots of primary stuff)".
- "Find exactly what you are looking for! This will save having to look through numerous pages".
- "I like it to find exactly what is required".
- "Categorise results, give useful and concise descriptions, give dates, give options for how to categorise results".

- "Images for specific units".
- "Online PowerPoint presentations finder".
- "Use information to enhance a PowerPoint presentation, hand-out or poster".
- "Find relevant info quickly and easily. Perhaps with links to relevant areas".
- "Easy to copy, paste, change".
- "I would like all the resources to be printable or useable".
- "Display examples of schemes of work-offer printable resources related to these".
- "Search specific year's topics and various types of differentiation to narrow down the searches".
- "Filter sites without educational content".
- "Search for resources by topic and type i.e. image, worksheet, simulation, movie clip, game ICT activity, spreadsheet etc".
- "Differentiate between free resources and those you have to pay for".
- "Provide researchers sites for student projects".
- "Give worksheets, diagrams, images objectives".
- "Give reasons, possible ways of using them, lesson plans and supporting information of advantages and disadvantages".
- "I would like it to find appropriate material, especially images which can be deemed appropriate for each year group and ability. I would also like to be able to find resources on all possible topics that could be covered. This would also include the well known areas and maybe few that are less known but still provide a useful tool to teach with".
- "Have example materials for specific searchers in videos".
- "Have up to date relevant hyperlinks".
- "Clearly defined age groups".
- "Give resources related to the curriculum for teachers and also have a more substantive concepts area through which pupils and teachers can research their subjects further".
- "It records my profile: at present I am teaching and also it remembers searchers I have made; it will 'volunteer' to save chosen sites into an organised stage area".
- "Contain images, bibliographies, quires, ideas for starts and planning to come together with relevant information".

7. Specification for a Personalised Search Tool for Teachers

7.1. Functionalities

The tool will provide options for teachers to search according to their current pedagogical requirements, such as if they want differentiated, cross-curricula or project-based materials. The tool will also store a profile of the teacher containing preferences that are likely to remain relatively constant, such as language and curriculum that it will use to help rank the LOs returned from a query.

Profile

Teacher Criterion	Example
User Name	M.Thomas
Language	English
Key Stage	KS 2
Curriculum	EDEXCEL
Free/paid resource	Free
Up-to-date resources	Last year

Metadata Field	Example
2.3.2 LifeCycle, Contribute. Entity when 2.3.1: LifeCycle. Contribute	"Author"
1.3 Language	"en"
5.7 Typical Age range	"7-9"
9.2.1 Source	"EDEXCEL"
6.1 Cost	"Yes"
2.3.3 Date	"2003"

Cross curricula Resources

Teacher Criterion	Example
Topic in mind	World War II
Subject	Math
Worksheets	Yes
Homework	Yes

Metadata Field	Example
1.2 Title	"World War II"
9.2.2 Taxon	"Math"
5.2 Learning Resource Type	"Experiment"
5.2 Learning Resource Type	"Exercise"

Differentiation Resources

Teacher Criterion	Example
Subject	English
Topic	Poem written by Simon Armitage
Type	SEN
Worksheets	Yes
Homework	No

Metadata Field	Example
9.2.3 Taxon	"English"
1.2 Title	"Number 133"
5.8 Difficulty: ▪ Very easy = SEN ▪ Easy = ESL ▪ Medium = Talented ▪ Very difficult = Gifted	"Very Easy"
5.2 Learning Resource Type	"Narrative Text"
5.2 Learning Resource Type	" "

Project-based Resources

Teacher Criterion	Example
Subject	IT
Worksheets	No
Homework	Yes

Metadata Field	Example
9.2.3 Taxon	"IT"
5.2 Learning Resource Type	" "
5.2 Learning Resource Type	"Problem Statement"

VAK Plus

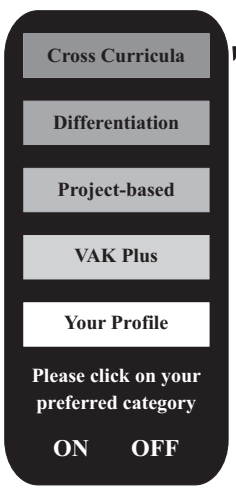
Teacher Criterion	Example
Subject	Addition
Type	Figure

Metadata Field	Example
9.2.3 Taxon	"Addition"
5.2 Learning Resource Type	"Figure"

7.2. Interface

This tool consists of five functions or buttons and teachers personal profile, which are cross-curricula, differentiation, project-based, VAK Plus and profile. Please see below for more explanation.

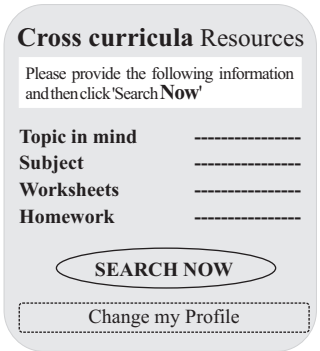
This represents the individual teacher's profile, which can be updated/ changed at any time by the teachers.



This is the tool and its possible functions, which can simply be included in the toolbar, for teachers to use.

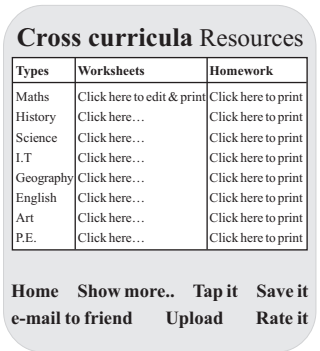
Teachers may turn on or off the tool at any time during their search.

Below are the possible screenshots and results for the four functions: Cross Curricula, Differentiation, Project-based and VAK Plus.



After selecting the 'Cross Curricula' option individual teachers need to type in their selected Topic i.e. World War II and the Subject he/she is teaching i.e. IT.

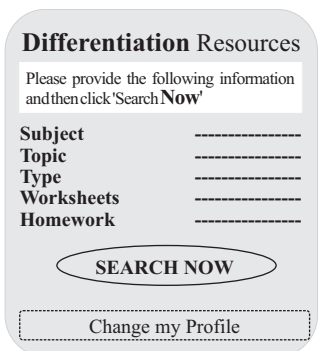
Teachers may also ask for worksheets and/ homework to give to their students.



On this page teachers can see the search result, which is based on both their search criterion and personal profile.

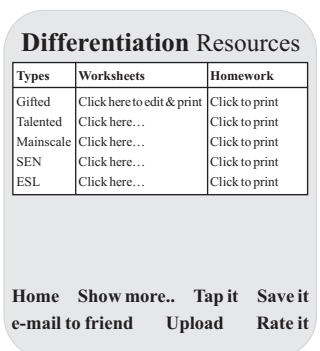
Teachers may save, tap on or even send their preferred resources to their friend/ another teacher.

Teachers can also rate each resource as well as being able to upload their own resource to the database in order to be used by other teachers.

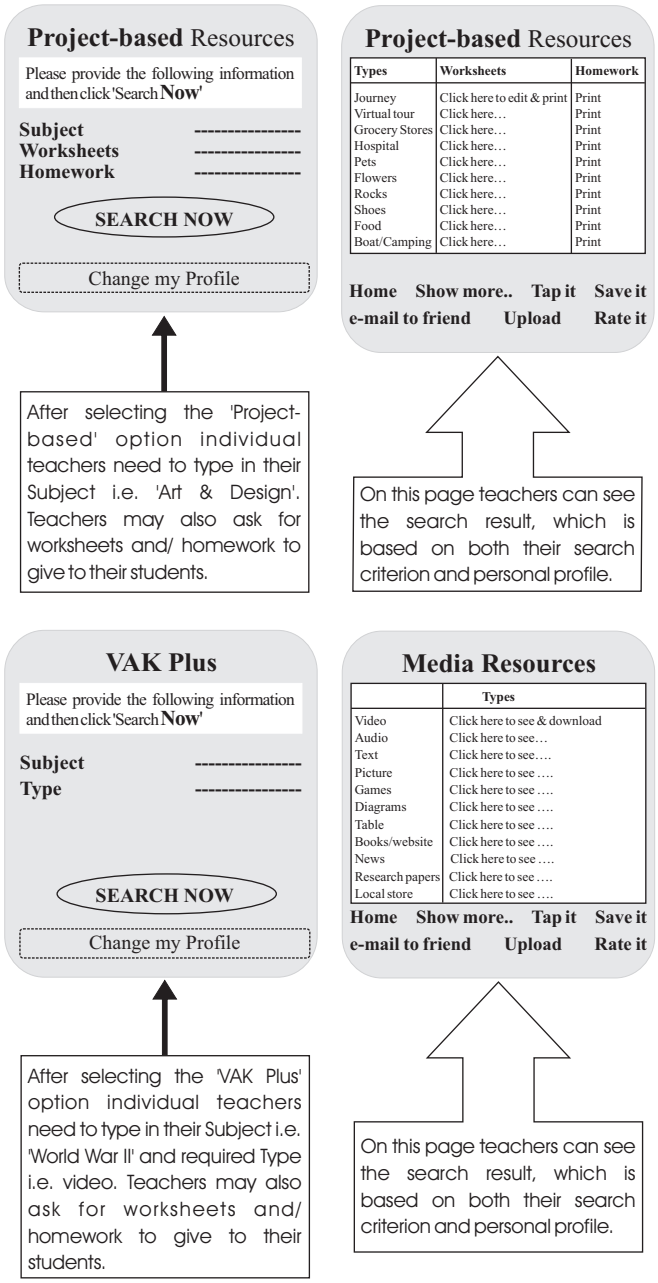


After selecting the 'Differentiation' option individual teachers need to type in their Subject i.e. English, selected topic i.e. Simon Armitage poem and specify their student's Type i.e. gifted.

Teachers may also ask for worksheets and/ homework to give to their students.



On this page teachers can see the search result, which is based on both their search criterion and personal profile.



8. Summary

In this paper we have identified the essential features needed for the PoSTech. Furthermore, the possible preliminary design specification and the interface have been discussed. The findings from the above empirical data will be then used and implemented into our prototype for further analysis and recommendation.

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