

Promotion and teaching of Agricultural Science and Languages in Schools - A practical approach

L.J. Mock,

Walpeup Vic.

Abstract

Language classes integrating agricultural science in primary and secondary schools can be used to foster a positive image of agriculture and language learning in Australia and worldwide. The paper aims to deliver a practical approach to assist teachers and curriculum writers. Students will be exposed to science, in particular agricultural science in a bilingual setting. Emphasis is placed on the importance of agricultural science and the learning of languages.

Key words

Agriculture, Languages, Science, Schools, Curriculum.

Introduction

The perception of a European agronomist visiting Australia is often that of a lack of positive acknowledgement of the role of Agriculture within the wider Australian community. It is also obvious that there is not a great interest in learning a language other than English, LOTE, especially within the Anglo-Saxon community. As a contrast the European, in particular the German education system and the general public places great emphasis on the importance of agriculture to every day life and language learning is never questioned as a key learning area. Schools, farming organizations and agricultural marketing bodies take great care to promote agricultural science and students learn at the very least one other foreign language at primary and secondary school level. It is however widely acknowledged that agriculture plays a positive role in a thriving economy nationally as well as internationally and that language studies are an integral part of any education. In a global environment any opportunity to foster knowledge of agriculture and to promote the learning of languages should be taken. One way to achieve this can be the integration of agricultural science studies into language studies. Practical examples to integrate Agricultural Science and LOTE are given from plant production, animal production and agricultural technology. All examples have been field tested in class. German is used as a language example, with relevant translations printed in italics.

The curriculum focus is based on Curriculum Standard Framework II, Board of Studies, Victoria, 2000. (1)

Methods

1. Integrating Science and Languages Other Than English, LOTE, studies

In a bilingual approach students can acquire a basic vocabulary of words relating to agriculture and will be able to use such terminology in reading, writing, listening and speaking. Simple or more complex research can be undertaken and the research results can be exchanged in all forms of communication. Scientific and agricultural information in English and in the target language and its culture can be consolidated in pure Language and pure Science lessons.

2. How to get started with agriculture

The possibility to start with a hands on approach in agricultural studies is always a draw card with boys and girls of any age. Students eagerly dig soil, and plant mysterious seeds from all over the world, observe what might become of them and explore their usefulness or their dangers. Rural and urban children alike love to learn about tractors and four wheel drives, to the effect that students quite willingly generate a lot of work for themselves! An old Lanz bulldog tractor, or a huge modern tractor or harvester

are very attractive to students. While there will be a focus on the achievement of the Australian agricultural industry, the international connections can be emphasized.

3. How to get started with language

Language studies will concentrate in the early years on simple words, phrases, repetitive slogans and then become more structured in later years with small sentences, questions and answers, debating and oral presentations. Reading and writing follow similar patterns, going from simple reading and writing to more structured and longer written texts, which can be reproduced orally through reading to teacher and peers.

4. What if you are not a science teacher, but a LOTE teacher and vice versa?

Where expertise is somewhat limited either in science or in language background there will be a great scope for a team teaching approach and for professional development for any subject teacher within the school. This will foster mutual understanding of different approaches and different subjects and explore their highs and lows. Children will also see that all subjects are related and how useful science and language learning can be, should there be any doubt.

The practical approach

1. Plant Production = Pflanzenproduktion

Orally and in writing, reading = *Mündlich und schriftlich, lesen*

- plant a mystery seed and observe its growth
- describe mystery plant, make predictions as to what it is
- harvest mystery plant or plants (depends on availability of school garden or school farm)
- describe agricultural plants/seeds/crops
- describe the environment
- describe end uses/plant industries
- discover botanical nomenclature and discover how internationally useful it is for scientific communication!
- *Beschreibe landwirtschaftliche Pflanzen/Samen/Feldfrüchte*
- *Beschreibe die Umwelt*
- *Beschreibe die Nutzung, Pflanzenindustrie*
- *Entdecke die botanische Nomenklatur und entdecke wie international nützlich sie für einen wissenschaftlichen Erfahrungsaustausch ist.*

2. Animal Production = Tierproduktion

Orally and in writing, reading = *Mündlich und schriftlich, lesen*

- describe farm animals

- describe their physiology (not too much detail)
- describe end uses/animal industries
- discover zoological nomenclature and discover how internationally useful it is for scientific communication
- *beschreibe Tiere auf dem Bauernhof*
- *beschreibe die Physiologie (nicht zu viel Detail)*
- *beschreibe die Nutzung/Tierindustrie*
- *entdecke zoologische Nomenklatur und entdecke wie international nützlich sie für einen wissenschaftlichen Erfahrungsaustausch ist.*

3. Agricultural technology = Agrartechnik

Mainly oral/ aural = *Hauptsächlich sprechen und hören*

- Describe machinery
- Describe details of machinery
- Sell and auction machinery

Example:

A big multilingual (English, French, German, Italian) poster for a large tractor can be used, and multilingual leaflets are available from every internationally represented manufacturer of agricultural machines. Multilingual manuals and spare parts catalogues of such machines can also be used. Students are to describe in simple terms the tractor in German, eg. there is the engine, this is the fuel injection system etc. This will be an exercise in free speech and will rehearse pronunciation. A little presentation by one or more students supported by pictures and descriptions on the poster will be ideal for students, who are not overly confident in sentence making and need picture prompts to keep them going. Agro-technical journals as a relevant original source can support the activity. Technical terms can be easily understood after short exposure, because many are quite similar. Students of all grades can create computer generated work sheets for themselves or for their peers, by using written and illustrated material, or they use a scanner, or maybe a digital camera to take pictures of their own machinery at home or on friends' farms. A farm machinery auction in the target language gives the commercial edge and emphasizes the relevance of numeracy.

Curriculum focus

1. Examples of contexts and learning activities

Investigate the living things from which foods originate and place things in a food chain

Investigate agricultural plants, animals and technology

Investigate in particular Australian foods, introduced and indigenous (bush tucker)

Investigate prices, analyze markets, debate value of merchandise

Design and carry out agricultural trials involving photosynthesis, animal metabolism, technological problem solving.

Debate the impact of variables, regular observation, data registration.

Learn to predict, make educated guesses and draw conclusions, record and substantiate findings

Selected vocabulary and information about major Australian crops.

Discover relationships within ecosystems and market systems

Learn to categorize

Learn vocabulary relevant to everyday life as well as Agriculture

Basic numeracy in both languages

Demonstrate comprehension of main ideas and concepts

Interact orally, by asking questions and giving the appropriate answer

React to answer and/or investigate further

Convey in writing a message relevant to the topic

Understand through reading more about the topic

Assess resource material and material produced by fellow students

2. Skills processes and procedures

Students will be able to pose questions, answer questions, make predictions, carry out simple investigations, produce work through the reading of texts as well as making a record of practical work. Students can group, categorize and assess scientific and non-scientific information.

Students will be able to work in groups, where they practise oral, aural, reading and writing skills at all times.

3. Learning outcomes

Plant and animal growth

Oral interaction about cropping and animal production in Australia.

Oral interaction about technology in agriculture.

Aural interaction by reacting to the auctioneer, to his/her sales pitch and number recitals

Written interaction by producing posters and project work

Revision of vocabulary

Grammar introduction and revision, e.g. aspects of tenses, verb conjugation, noun declination and idiomatic phrases.

Linguistic studies by comparing expressions in the first language and the target language.

Sociocultural knowledge, what does one eat, see and appreciate in the target country

4. Assessment

Assess analytical and observational skills from posters, and project work and judge oral presentations of project work

Assess team working skills

Assess writing and drawing skills by judging a student generated promotional poster for Australian plant products.

Assess writing competency by judging a student generated promotional poster for Australian value added animal products.

Assess technological knowledge by judging project work and presentation of project work

Assess speaking skills and listening skills by judging students interaction at the machinery auction.

Overall assessment can be in the form of a school based “Agronomy Conference”, with posters, oral presentations including discussions and maybe a trade display, if it is possible to use a school garden or farm to produce agricultural and horticultural products at school.

An end of term conference dinner, named “From Paddock to Plate” could conclude the agrolinguistic experience.

Conclusion

By using agricultural science and language studies together, students can discover the usefulness of both. The approach will create an interest in taking up more intensive agricultural science units at school and tertiary institutions and lift the profile such studies have. There are a multitude of spin offs for careers in agriculture related sciences besides the ones mentioned. Students could consider expanding their studies into meteorology, earth and soil sciences, marine biology, food technology, agrochemistry, market research and international agricultural business management. Language can be seen as a tool to exchange findings in research and development, understand economics and international relations. Students will also be able to consider studying a combination of natural sciences and language studies, creating flexible thinkers who are aware of the big picture.

References

Board of Studies, 2000, Curriculum Standard Framework II, Board of Studies, Victoria.