Educational communication resources on the health benefits of seafood
6.0 Introduction

The Centre of Excellence for Science, Seafood and Health (CESSH) aims to effectively promote the benefits of seafood consumption, mindful that resources that we create must not only act as effective tools for stimulating behaviour change and the acquisition of knowledge; they also need to sit comfortably within the rationale of external structures including whole school health curricula. CESSH has developed primary school resources, a secondary resource and a vocational training resource, all of which are compliant with existing structures, such as the Curriculum Framework. The secondary school resource also meets the requisites of future structures in that it was developed to meet the broad range of key skill and knowledge areas highlighted in the 2010 National Curriculum Board’s Shape of the Australian Curriculum.209

6.1 Communication strategies: Education

There is no ‘one size fits all’ philosophy that is effective for communication within educational settings. To ensure optimal effectiveness, however, key outcomes first need to be identified, resources developed, and knowledge transfer considered in educational communication strategies. A number of the key issues that should be considered are discussed below.

6.1.1 Identifying key outcomes and providing novel information

What do we want the target audience to know? What do they want to know? In determining the outcomes to be achieved in terms of knowledge, attitudes and skills, the educational procedures and protocols are often externally determined, known as a ‘top-down’ approach. While this may be appropriate for the desired outcomes of the funding bodies and key stakeholders, it can impact on the effectiveness of interventions. Working closely with educators and specific target groups, interventions can be tailored to consider, clarify and/or incorporate existing knowledge and beliefs of the target group. This approach maximises opportunities for knowledge transfer.

Assessing the needs, resources, opportunities and challenges of working in particular settings with specific target groups is essential to successful planning. Existing programs, measurement tools (e.g. assessments, tests, surveys and interview schedules) and people already working in the area should be considered or consulted as part of the needs assessment process. The results of these types of in-depth analyses provide evidence required to produce student or target centred learning resources that effectively fulfil existing and future educational needs.

6.1.2 Designing target appropriate resources

Target appropriate: readability testing is not enough. Developing resources includes encompassing appropriate grading of language for age and developmental levels. The language level used in resources can easily be assessed using simple validated measures such as the SMOG (simple measure of gobbledygook) readability test.207 Attention should also be given to the manner in which new and complex terminologies and ideas are introduced. Furthermore, the progression of incremental and accelerated learning must be considered in conjunction with cognitive and neurological development. What is needed by resource developers is an understanding of how to introduce new and complex terminology in an accessible manner, to a variety of target groups.

Accessibility and equity. Resources should be appropriate to the widest possible spectrum within a target group and must not support or contain stereotypical representations of any gender, culture or class. Resources must be developed so that barriers to uptake are minimised, whether they be geographic, socio-economic, linguistic or otherwise.

Script competence friendly. When preparing educational experiences that will take people out of their familiar environments, consideration must be given to facilitating the transition. For example, familiarisation training around the use of an online delivery system would be required before accessing an online resource using that delivery system. The inbuilt training of resource delivery systems will maximise the uptake, usability and learning experience of participants. On this note, it is vital that the choice of mode of delivery that will likely be uptaken by a designated target group be part of the needs assessment planning. For example, younger children respond better to pictorial and experiential learning styles. Overall, most people, regardless of age, retain knowledge if it is delivered within a familiar context and retain skills if they are first allowed to practise these skills in a supportive environment with assistance on hand if required.

6.1.3 Rationales, guides and user manuals

Guidelines are developed to support implementation of resources. They may include: a rationale for the resource; frameworks, theories and/or models on which the resource was developed; evidence on which the resource is based; how to deliver the resource; how to assess the learning experience; and detailed information on how the dissemination, implementation and evaluation of the resource should occur.
6.1.4 Transmission of knowledge

People are likely to engage with resources or programs that are interesting, relevant and attractive. Understanding how a target group perceives itself is essential to produce materials with optimal efficacy. The most successful resources are: those that are evidence-based; have input from a number of experts in each of the areas that the resources cover; are piloted prior to extensive dissemination; and, most importantly, are developed in consultation with the end-users.

6.1.5 The Revised Bloom’s Taxonomy

The Revised Bloom’s Taxonomy (RBT)\textsuperscript{210} is useful for ascertaining the level of thinking that specific materials require to engage the target group (see Figure 6.1).

\begin{figure}
\centering
\includegraphics[width=\textwidth]{ Revised Bloom's Taxonomy}
\caption{Revised Bloom's Taxonomy. (Source: \textsuperscript{210})}
\end{figure}

Most health promotional material resides at the base of the RBT, demanding only that knowledge provided be remembered, though the goal is actually to move up at least the next two levels, to understanding and applying. The challenge is to provide engaging materials that require the target to do more than passively acquire knowledge. The target group needs to understand and ultimately apply the knowledge learned to achieve behaviour change. CESSH’s interactive ‘Seafood the Super Food’ resource facilitates the movement from remembering to understanding for primary school-aged children; tasks in the secondary school resource take students to the very top of the RBT, where students are required to not only develop their critical literacy in understanding the manner in which advertising and health promotion intersect, they are also called upon to use those new principles in creating their own health promotion materials.

6.1.6 Assessment beyond the traditional concept

Self and peer assessment are important learning tools. They encourage participants to engage in neutral critiques of their work and the work of others. While formal assessment is important, post-modern education places a much greater importance on anecdotal evidence than ever before. Non-traditional assessment may involve portfolios of student work and other measures such as teacher records of student attitudes and comments.

Resources developed as part of the CIISC Project are evidence-based and have incorporated a variety of assessment and learning types in an effort to maximise their effectiveness.
6.2 Primary school resources

6.2.1 Introduction

Having identified a need for tailored educational resources for younger students, a team was created within CESSH, tasked with translating research findings into a suite of electronic assets. The multidisciplinary team had a range of skills and expertise including research, classroom teaching experience, curriculum development, graphic design and Flash (Actionscript 3) programming.

6.2.2 Kidzone

A dedicated section of the CESSH website was created to house resources for primary school-aged children. This was considered important in providing an accessible and immediately recognizable entry point to the site, both for schools and for individual children rather than requiring them to navigate through the website. A child-friendly name (Kidzone) and cartoon-themed brand identity was created, focusing on a cast of six young characters that would be used in various ways across the range of resources.

6.2.3 Research findings

The basis of the project was the comprehensive CESSH Review of literature relating to the health benefits of regular consumption of seafood as part of a healthy diet. Findings from this review were grouped into two areas - general health benefits of seafood consumption, and specific information related to omega-3 intake.

An early decision was made to shift the focus from general chronic conditions, to benefits for specific parts of the human body. This was deemed important in making the resources accessible for younger children, who would be unlikely to have either a full understanding of conditions such as arthritis or diabetes, or the maturity to understand the connection between their current actions and their future health and well-being. Thus, speaking about seafood ‘helping to keep our hearts healthy’ was deemed better than discussing the prevention of coronary heart disease to this target group; likewise, saying fish was ‘good for our brains’ was preferable to saying it had been shown to reduce rates of Attention Deficit Hyperactivity Disorder (ADHD) and Alzheimer’s Disease.

This approach also made it possible to include information about less significant (but still valid) seafood health claims - such as those for skin, teeth, and hair. It also necessitated further supplementary research. Additional information was obtained from a number of sources.

The team met with educational experts and graphics designers to discuss the most effective formats for communicating the key messages to school-aged children. A rigorous process of development, consultation, revision and testing followed resulting in an online resource developed in association with the Australian National Curriculum to maximise uptake by schools and educational organisations. They were also tested with the target group to ensure acceptability, accessibility, knowledge transfer and enjoyment by users from the target group. The interactive format of the resource package makes it accessible to students throughout Australia across metropolitan, regional, rural and remote areas.

The two resources developed for primary school-aged children were:

- **Seafood the Super Food** - an interactive ‘body click’ resource that shows how each of the major nutritional components of seafood impact on the body’s physiology and the health benefits that each can provide. A quiz to test knowledge transfer associated with the game is also available.

- **Amazing Omega-3s** - an interactive game that encourages children to ‘catch’ their required omega-3 intake for a week. Support material includes a quiz, word sleuth and seafood identification activity. Teacher support material was also developed.

6.2.4 ‘Seafood the super food’

The first resource was intended to give children an overview of the health benefits of seafood consumption, using a ‘body parts’ approach. Research findings were grouped based on the parts of the body that could be said to be benefiting according to the various health claims. Table 6.1 presents a brief summary of the grouped findings.
Table 6.1. Health claims grouped by anatomy.

<table>
<thead>
<tr>
<th>Part of Body</th>
<th>Nutrient and Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hair</td>
<td>Vitamin A in fatty fish strengthens hair and slows down hair loss.²¹²</td>
</tr>
<tr>
<td>Eyes</td>
<td>Vitamin A and omega-3s in fatty fish assist vision and can be preventative against certain eye complaints.²¹²</td>
</tr>
<tr>
<td>Skin</td>
<td>Vitamins A and E, and zinc, found in fatty fish, promote better complexion and assist skin healing.²¹²</td>
</tr>
<tr>
<td>Teeth</td>
<td>Calcium and fluoride found in bony fish assist with dental health.²¹²</td>
</tr>
<tr>
<td>Brain</td>
<td>Omega-3s in seafood are important components in brain growth and development, and are preventative against some behavioural and learning problems, including ADHD.²¹¹, ²¹⁴</td>
</tr>
<tr>
<td>Lungs</td>
<td>Omega-3s in oily fish may be preventative against asthma.²¹¹</td>
</tr>
<tr>
<td>Heart</td>
<td>Omega-3s in oily fish may be preventative against heart disease.²¹¹, ²¹³, ²¹⁴</td>
</tr>
<tr>
<td>Muscles</td>
<td>As a source of vitamin D and a lean protein source, seafood plays a role in growth and development.²¹²</td>
</tr>
<tr>
<td>Nerves</td>
<td>Vitamin B12 in fish protects human nerve cells from damage.²¹²</td>
</tr>
<tr>
<td>Blood</td>
<td>Iron in fish and some seafood promotes red blood cells count, assisting circulation and respiration.²¹³</td>
</tr>
<tr>
<td>DNA</td>
<td>Vitamin B12 in fish assists with DNA multiplication.²¹²</td>
</tr>
<tr>
<td>Bones</td>
<td>Fluoride, omega-3s, vitamin D and calcium in fish promote bone strength and are preventative against osteoporosis.²¹²</td>
</tr>
<tr>
<td>Thyroid</td>
<td>Iodine and selenium in shellfish and other fish promote thyroid health, assisting metabolism.²¹²</td>
</tr>
<tr>
<td>Immunity</td>
<td>Vitamin A in fish strengthens the human immune system.²¹²</td>
</tr>
</tbody>
</table>

Great care was taken in converting these research findings into finished copy for the resources. It was deemed important to produce lively and accessible language that remained factually accurate. This task was overseen by team members with both classroom and curriculum development experience. Two examples follow:

*Eating mussels can help your muscles! The vitamin D in fish can increase your strength, and the protein in seafood is used to build and repair muscles. You can beef up without the beef!*

*The fluoride, omega-3s, vitamin D and calcium in fish keep your bones strong, helping to stop a disease called osteoporosis which can make your bones break really easily when you get older. Eating fish is like banking for your bones; depositing calcium now will help your body in the future.*

A finished copy was then passed on for graphical treatment and production. Using the Kidzone character ‘Jack’ (see Figure 6.2), an interactive small web file was created, in which users are able to click various body parts and be presented with applicable seafood and health information (see Figure 6.3).
A worksheet was also developed for teachers to use in the classroom, in conjunction with the web resource.

6.2.5 ‘Amazing omega-3s’

A second resource focused on omega-3s, their effect on human health, and the important role that fish and seafood plays in the provision of these essential fatty acids. Once again, findings from McManus, Howieson and Nicholson and other sources were compiled and reworked into appropriate child-friendly copy. This was supplemented with the specific omega-3 levels found in various fish species and seafood types, obtained from the 2007 Australian Nutrients Database (AUSNUT).

This resource took the form of a game in which the user plays a Kidzone character ‘Sally’, who is fishing from a pier (see Figure 6.4). As the user makes catches - randomly selected from a pool of 15 fish species, three seafood types, and four whimsical ‘booby prizes’ (such as a boot or unicycle) - an appropriate figure is added to their omega-3 score. This is based on the omega-3 value contained in a 100g serving, and is represented on a meter at the side of the game screen. The user’s objective is to ‘catch’ 10,000mg of omega-3s before randomly landing a giant squid, at which time the game ends. This nominal figure was decided upon after extensive testing to find the optimal point at which the game was challenging, but not overly long. This proved a difficult balance to strike, given the disparity of values involved (over 2000mg of omega-3s for one species, less than 200 for another).
In addition to the gameplay itself, a number of screens present background information about omega-3s and their role in human health (see Figure 6.5). Two worksheets were developed to assist teachers in using this resource, and all three assets were published on the CESSH Kidzone website.

**Figure 6.5: Worksheets for online resources**
6.3 Secondary School Resources

The Seafood and health: Teacher resource for secondary students was produced for secondary schools to develop students’ understanding of the benefits of seafood for health. The rationale for the development of this resource was:

- To provide an independent resource for use in the Health and Physical Education Year 12 Curriculum in Western Australia;
- To provide students with a brief introduction to the nutritional benefits of seafood, additionally making reference to current issues that may impact on seafood consumption;
- To provide a resource that is easy to understand, factual and engaging;
- To provide a basic introductory resource that can be utilised in diverse classroom contexts; and
- To raise awareness of the importance of regular seafood consumption in the diet as a nutritional imperative.

Overview of teacher resource

1. Rationale

2. Course outcomes
   - Course content
   - Course units
   - Assessment type weightings

3. Healthy living introductory activity
   - Student handout
   - Answer sheet

4. Group activity: Spatial mapping
   - Resource list: nutrition and healthy eating in Australia
   - Video list
   - Assessment sheet

5. Critical media review
   - Assessment sheet

6. Health survey: Fish and seafood consumption at school
   - Student handout
   - Example survey/ questionnaire
   - Peer assessment

7. Presentation and fact sheet
   - Topics for presentation and fact sheet
   - Presentation and fact sheet handout
   - Presentation and fact sheet cover page
   - Peer assessment

8. References

9. Appendices
   - Agencies and website
   - Extra curricula activities

The teachers’ resource package is a set of five activities and assignments covering nutrition and the importance of seafood as part of a healthy balanced diet. The assessments include a group activity in spatial mapping, a critical media review, the development of a health survey for fish and seafood consumption in school, the development of a fact sheet and delivery of a presentation. Each activity outlines for the teacher the rationale for the assessment, the course outcomes covered by the assessment, suggested duration and sequence of the lesson, as well as a guide for any advance preparation needed by the teacher. The resource package also includes assessment sheets, answer sheets and resource lists for ease of use.

The first activity ‘Healthy Living Introductory Activity’ highlights the importance of nutrition and exercise as part of a healthy lifestyle based on the Australian Guide to Healthy Eating and the National Physical Activity Guidelines. This minor informal assessment is designed to be a student-centred self assessment, introducing core concepts central to health promotion in adolescents and fostering introspection about personal practices of exercise and eating.

The second activity is designed for group work and involves spatial mapping. It aims to establish foundation knowledge about the nutritional benefits of seafood, and knowledge about the environment, sustainability and new technologies related to the seafood industry. Ideally, this activity would follow previous nutrition and healthy eating education that situates seafood as part of a healthy diet. This assessment helps develop students’ group skills and interaction.
The critical media review is the third activity in the resource package and is designed to develop students' critical thinking skills in evaluating information in the media. This is an important skill for students, particularly with the current advances in technology and the increasing use of the internet for health information. This assessment can facilitate the further development of students' critical literacy skills while providing an opportunity for demonstrating the four course outcomes.

The fourth activity and assessment involves the development of a health survey which enables students to actively engage with research principles in health; physically and mentally moving them beyond the classroom. This assessment involves research, group work, questionnaire development, and the incorporation of maths, science and epidemiology.

The final activity and assessment involves developing a fact sheet and delivering a presentation. This assessment demonstrates the four course outcomes and allows students to further develop their research skills and presentation skills. A peer evaluation element is incorporated into the assessment which helps to enhance students’ meta-cognitive capacities as, through peer evaluation, students learn the tools for self evaluation.

### 2. Course outcomes

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<thead>
<tr>
<th>Outcome 1</th>
<th>Outcome 2</th>
<th>Outcome 3</th>
<th>Outcome 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge and understandings</td>
<td>Beliefs, attitudes and values</td>
<td>Self management and interpersonal skills</td>
<td>Health inquiry</td>
</tr>
</tbody>
</table>

#### Course content

- Health concepts
- Health skills and processes
- Attitudinal and environmental influences over health

- An holistic/social view of health
- Self-management skills
- Personal beliefs, attitudes and values influence health behaviour

- Health principles, frameworks models and theories
- Interpersonal skills
- Social and cultural norms and expectations influence health behaviour

- Actions and strategies for health
- Health inquiry skills and processes

- Health care systems

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The resource activities can be utilised independently or sequentially, for use in diverse classroom contexts. The resource is designed to be easy to understand, factual and engaging, as well as meaningful and relevant to students and facilitate co-operative learning. It aims to raise awareness of the benefits of seafood consumption as part of a healthy diet through varied choices of topics, and allows students to work through concepts and processes supportive of health-promoting food choices. It also promotes meta-cognition so that students can continue to learn about food issues and behaviours in new life situations. The resource activities are based on Curriculum Council Sample Unit Package for easy adoption into the existing education framework for teachers.
6.4 Vocational Skills Set Training Resource

6.4.1 Introduction

The Principal Investigator met with staff involved in industry training from the major vocational training institution in Western Australia and conferred with key stakeholders across Australia, including Roy Palmer from Seafood Experiences Australia and Dr David Milne from the Australian Maritime College (AMC). A short scoping survey was also distributed through industry organisations and entities to gauge the vocational training needs of all sectors of the seafood industry. Current vocational curriculum material available across Australia and New Zealand (basis of AMC courses) were reviewed.

All information collected was synthesised and the core components for inclusion in a vocational training package were identified. A senior educational specialist with expertise in curriculum development and familiarity with the training needs of the seafood industry was employed to develop a vocational training skills package. The resource was developed in accordance with recognised methods used within the Australian Seafood CRC training projects as part of CRC Program 4.

6.4.2 Vocational Training Resource

The resultant training resource pack is entitled *Seafood and health: A vocational training resource* and includes:

- Instructor resource;
- ‘Seafood and health’ powerpoint (see Figure 6.8);
- ‘Seafood and health’ handout;
- Quick seafood quiz;
- Quick seafood quiz answer sheet;
- Student task handout; and
- Self assessment handout/peer assessment handout.

*Figure 6.8: PowerPoint slide presentation.*
The resource has been developed to provide instructors with everything required to administer the course to industry participants across all seafood sectors providing an overview of the relationship between seafood and health. The instructions also note that the assessment tasks can be modified depending upon the assessment requirements of the institutions or bodies administering the course.

6.4.2.1 Rationale

The rationale for the Seafood and Health: A Vocational Training Resource are:

- To provide students with a brief introduction to the nutritional benefits of seafood, additionally making reference to current issues that may impact on seafood consumption;
- To provide a resource that is easy to understand, factual and engaging;
- To provide a basic introductory resource that can be utilised in multiple course contexts; and
- To raise awareness of the importance of regular seafood consumption in the diet as a nutritional imperative.

6.4.2.3 Competencies assessed

The competencies assessed in the vocational resources are listed in Table 6.2. The suggested duration of the sessions is 1.5 hours however they may be readily adjusted to meet different time constraints. For example, if students are preparing foods on campus or at school an extended lesson is advised.

Table 6.2: ‘Seafood and Health: A Vocational Training Resource’ - competencies

<table>
<thead>
<tr>
<th>Assessment type</th>
<th>Knowledge of nutritional values in seafood</th>
<th>Knowledge of current issues in seafood</th>
<th>Preparation of seafood product/presentation</th>
<th>Budgeting/planning skills</th>
<th>Evaluation skills</th>
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</thead>
<tbody>
<tr>
<td>Recipe Sample</td>
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<tr>
<td>Self-assessment</td>
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<td>Peer assessment</td>
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<td>Quiz</td>
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The full resource - with the exception of the student assessments - is available on the CESSH website at www.cessh.curtin.edu.au. As the vocational resource is part of an accredited course, assessments have been provided to institutions on request.

6.5 Conclusion

CESSH developed two primary school resources, a secondary school resource and vocational training resources. These resources were produced in conjunction with educational experts and graphic designers to ensure optimal effectiveness.