Australian Flexible Learning Framework

Supporting Flexible Learning Opportunities

Blended chocolate

Shareable Learning Objects for the Baking/Pastry Industry

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Executive summary

The project investigated the implementation of a shareable learning model (see Figure 17) for the baking industry and explored the possible different outcomes for students, teachers and industry. The baking industry relies heavily on traditional training and learning models. For this project, measurement of delivery of content using technology and shareable resources and comparison of outcomes against traditional face-to-face methodology was used. An integrated model for delivering flexible content will be suggested from the outcomes and findings. Measurement of success to date has included feedback surveys and analysis of enrolment, participation, attrition, course and module completions.

The Hunter region is constantly growing as a tourist destination[1]. The baking/pastry section at Hunter Institute has an excellent reputation and relationship with various industry stakeholders in the baking/pastry industry. There are approximately 54 Bakers Delight stores, 18 Brumbies stores, 45 Woolworth's, 36 Cole's and many independent bakeries that we offer training and assessment to. The section has strong industry partnerships with Baker's Delight, Goodman Fielder and Sara Lee and is currently negotiating Memorandum of Understanding (MOU) with Woolworth's, Cole's and Brumbies.

This research project seeks to further enhance these relationships and enable the transfer of current knowledge, skills and technical applications from successful industry players to fellow staff and students. Providing examples of international techniques will enable ongoing improvement in the creation and execution of dessert and pastry items to fulfil increasing customer demand.

Opportunities exist to share material from the Callebaut plant in Singapore and to send students there. It will assist in the establishment of a network with key employer groups in Australia to support delivery through multimedia learning objects. The analysis made in this context will allow the adaptation of the implemented system to maximise outcomes with a strong customer focus.

The research adopted an approach of comparing two groups of students currently studying the baking trades course. Ninety students agreed to partake in the research process. These 90 were divided into two groups. The first were to be called the 'face-to-face group'. Content was delivered in a traditional learning environment. The lessons were teacher-centred and all content was delivered within the classroom. The second group we designated 'hybrid'. These students were given tasks to complete before each lesson. These tasks were delivered via SMS, email and a website that was designed for this project at www.blendedchocolate.com. The lessons conducted on campus were student-centred and self-paced. The teacher was now a facilitator and mentor. The data to be collected was to compare the knowledge and skill level of the two groups. Would students access resources outside the traditional learning environment? How much time would be spent using these and how much time would be saved accessing the campus? Would the participants have a higher

[1] Report in Newcastle Herald, 5th March 2004 - 'Weekend getaway' - ranked the Hunter as the seventh most visited destination in Australia

skill and knowledge level? Do students feel comfortable using technology as a resource and does the Baking industry support this?

In this era of flexible and self-paced learning, workplace delivery and assessment and e-learning, the project was designed to compare and identify the outcomes of these and traditional face-to-face delivery methods for this particular trade area. In the TAFE NSW Student Satisfaction Survey (2004), it was shown that the most popular student reaction to the question, “My program of study would better meet my needs through…” was “finish my course in less time” and “less class time”. In this context, the project wanted to identify methods of making e-learning be more effectively integrated to meet the needs of this industry sector. The literature research revealed that there are no flexible learning models currently being employed in the baking industry in Australia. The current training climate within the educational sector for this particular industry is very antiquated. All training is conducted on campus. No workplace training is offered; flexible learning environments are not considered.

For TAFE to have access to contemporary and relevant resources, industry partnerships must be established. Barry Callebaut has been producing cocoa and chocolate products for more than 150 years. They are a fully integrated company that masters every step; from the sourcing of cocoa beans, to the shelf. Callebaut are a major supplier to the baking industry.

Today, they are the world's leading manufacturer of high-quality cocoa and chocolate products. They have a global network with about 30 state-of-the-art production sites and some 9,500 employees in 17 countries in Europe, Africa, North and Latin America and Asia/Pacific. Barry Callebaut has strong traditional roots in Europe, is headquartered in Switzerland and listed on the SWX Swiss Exchange.

The resources Callebaut have developed, (DVD, audio and manuals, for in-house training and promotion) are of the highest quality. A partnership was formed between Callebaut and the Hunter Institute of TAFE for this project, so we could share these resources and knowledge. In return, they could use the completed website for international training of their chocolatiers.

Chocolate work is a growth area in the industry with more educated customers raising the level of expertise and finish of products. High-end chocolate skill sets often do not exist within the current lecturer groups. Lecturers and instructors from a variety of registered training organisations (RTOs) and industry will be able to access up-to-date international information negating the need for individual visits to specialised schools such as the Callebaut School in Singapore. Industry will be able to expand its knowledge base through access to the learning models. The content focuses on the latest trends within the industry, with ease of updating, due to the nature of the online environment.

The learning object model will form an ideal platform for expansion to other content once the viability of the concept has been proven through the research analysis. This project will build on previous research sponsored by the Australian Flexible Learning Framework (Framework) such as: Exploring Educational Design (2003), VET Learning Object Repository, Good Practice

Models for Flexible Learning. Jurisdictional issues include copyright and intellectual property considerations.

The baking/pastry industry has a high degree of variable work hours and a high level of casual employees. Workers have difficulties accessing traditional institution-based training due to these constraints and distance. The Hunter Institute provides training for students through block release and flexible options from Hornsby in Sydney's north to Murwillumbah on the far NSW North Coast. Forty-four percent of the baking students currently enrolled at Hamilton travel from outside the Hunter region. These students must leave their workplace, family and homes to access the campus and training facilities for a period of three weeks twice a year. The proposed delivery model focused on customer needs and accessibility. The research underpinned a future delivery model and allow for adaptations of the learning objects following user feedback and input from stakeholders. The proposal will be able to build upon existing models of blended delivery and expand these findings upon the new target groups.

This project identified a number of possible ways to remove barriers to the effective uptake of e-learning. It incorporates a wide range of significant previous Framework projects including the following:

- Exploring Educational Design (2003)
- VET Learning object repository
- Access & Equity
- Good practice models for flexible learning

Engaging industry in flexible learning, VET Interoperability Framework areas relevant to this project include content format, packaging and intellectual property considerations.

Recommendations

Training Providers

- that training providers find a balance of delivery needs between industry, learners and teachers in the growth industry of Tourism and Hospitality helping to service the high performance training needs in Australia.

- that training providers adopt a shareable learning object approach to the management and development of learning materials, resources and assets, ensuring sustainable, scalable and manageable delivery of flexible learning.

- that training providers develop a blended learning model to reflect current industry practices and resources (e-learning) to enhance learning in specialist fields.

- that RTOs engage practitioners in a complete cycle of contemporary e-learning development to develop better solutions through staff development programs.

- that training providers involve the relevant industry organisations and employer groups in a collaborative approach to share the findings for improved processes and relevance of training to reflect a continuous improvement philosophy.

- that RTOs approach relevant industry bodies to improve and expand industry partnerships to allow access to shareable resources to enhance training and learning.

- that training providers make digital resources freely available for potential enrolments to view before actually enrolling. The resource then becomes a promotional tool as well as an educational tool.

- that training providers collaborate to investigate the possibility of networking bakeries, kitchens and classrooms to allow online access to students and teachers.

Baking Industry

- that the baking industry supports structured training in the workplace for apprentices and trainees. Apprentices access a TAFE campus 36 days per year, all remaining training occurs in the workplace. This training is not recognised by assessment within the TAFE sector. By introducing quality structured workplace training and using resources that have been developed through partnerships and consultation with relevant industry bodies, far more relevant and cost effective training will occur

- that the bakery industry share resources with RTOs to assist in developing better models of learning. Within this research project, we have demonstrated that sections of the baking industry will support the use of their resources if quality outcomes can be demonstrated.

- facilitate training partnerships and Memorandums of Understanding with RTOs.

- that the industry acknowledges and appreciates that apprentices attend 36 days per year at a TAFE campus. All other training occurs in the workplace. If resources are developed to support, enhance and improve training, then the baking industry must support the use of these.

- that companies set aside designated times for their employees, so that formal training can occur in the workplace.

- that the baking industry work with TAFE Institutes to examine more efficient and effective means of training apprentices, recognising the potential for e-learning as a useful and successful tool for the training of staff.

- that supports in the baking industry change. The baking industry needs to examine more efficient and effective means of training apprentices. The industry must recognise that e-learning, if delivered correctly, is a useful and successful tool for the training of staff.

Introduction

The purpose of the project was to investigate the need for new models of training to improve the quality of training in the Tourism & Hospitality Faculty of the Hunter Institute of TAFE. Following preliminary research, it was decided to develop and trial shareable learning objects with a view to proposing new models of training.

The primary goal of the Hunter Institute Tourism & Hospitality faculty is to meet the needs of a wider cross section of the community and also improve the services for current and prospective clients (see Table 1):

Table 1: Strategic direction

Tourism and Hospitality Faculty Business plan goal	**Hunter Institute Strategic Plan goal**	**TAFE NSW strategic directions**
1.1 The faculty facilitates the acquisition of skills and knowledge to allow our clients to perform effectively in their chosen industry.	1. Excellence in learning and the learning environment.	Empower all of us to excel
1.2 The faculty implements industry focussed training to enable clients to become highly productive professionals.	3. Strengthened organisational culture and capacity	Innovate to improve our products and services for our customers
6.1 Actively support existing innovation based teams and staff in an outcome focussed approach through a monitored range of channels.		

Regular faculty management reviews and monitoring indicated that participation rates, course and module completion rates could be improved, student attrition rates could be further lowered and greater learner choice needed to be achieved. Statistics collected and analysed by the faculty demonstrated average measures of success.

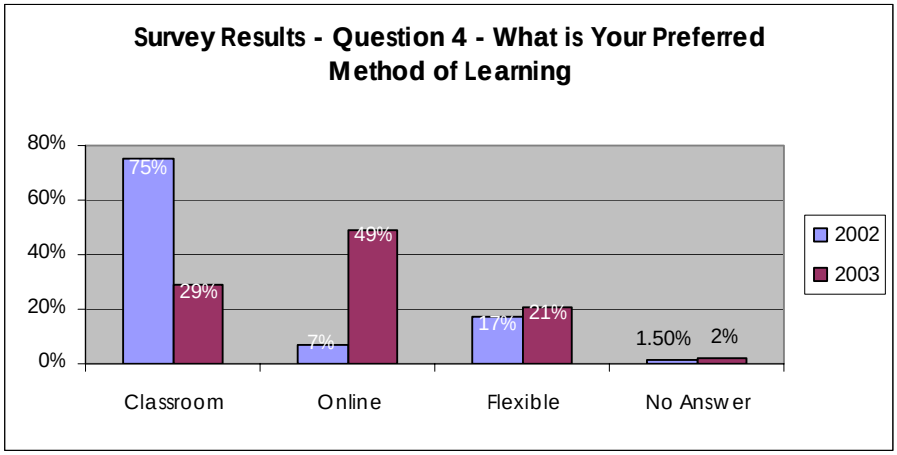
Initial feedback through industry liaison groups, student reviews and staff feedback identified teaching and learning problem areas:

- the current methods of course delivery limit the access of students.
- delivery varies across all sections and campuses.
- course material delivered can become outdated.
- delivery may not allow for different learning styles or study patterns

A survey was designed to assess the factors that students considered important in their studies. It also examined the following problems which were considered essential for improved delivery. The results showed that in 2003

many more students preferred online learning, in contrast to 2002 where there was a stronger preference for classroom learning (see Figure 2).

Figure 2: Preferred method of learning



Analysis of existing situation and possible courses of action

A faculty team was formed to assess the scope and causes of the problems in teaching and learning. This team, the Tourism & Hospitality Faculty Third Generation Implementation Forum, collected data, analysed findings and scoped possible solutions. The team goals for this project included:

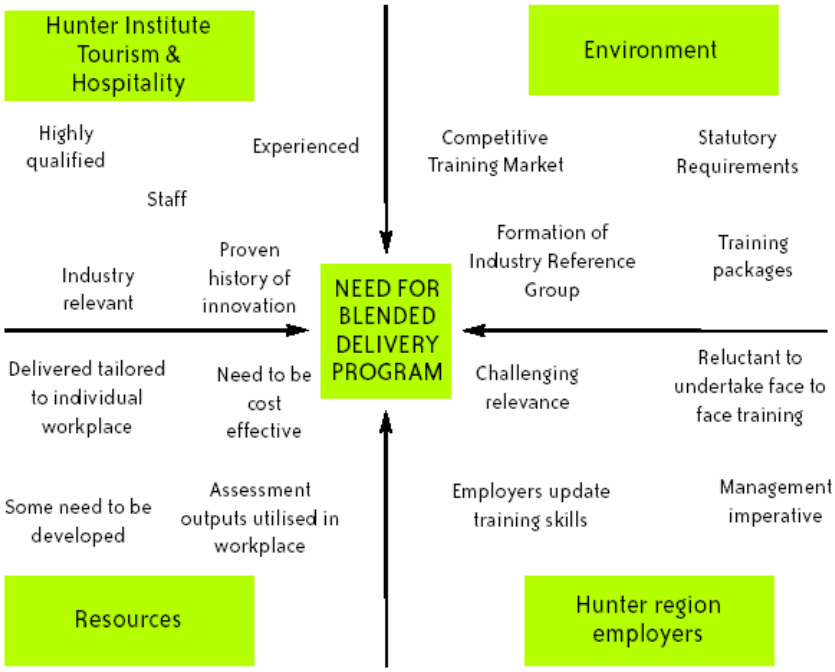
- to ensure uniformity of content delivery across the Institute using a range of delivery methods
- to ensure cross discipline consultation was undertaken in regards to training needs required by all teachers.
- to ensure stock take of existing resources and delivery styles.

The team defined strengths and weaknesses in the existing methods of delivery. The results of their analysis showed:

- existing delivery allowed for value adding by the teacher.
- existing delivery did not inherently allow for different learning styles, time constraints and/or outside pressures on the students.
- existing delivery did not reflect the changing nature of the future student needs.

A swot diagram created by the team summarised the strengths and weaknesses of the existing approach. (see Figure 3).

Figure 3: SWOT Analysis



Initial meetings with local industry representatives were met with some scepticism and definite concerns. The team premise was to research thoroughly to address the question of how to cope with industry concerns in the most effective way. Research into the Framework provided guidance on how to implement e-learning solutions effectively. A summary of the consultation issues discussed with local industry and employers included the following:

Synopsis of Issues:

- T& H training has increased considerably in student numbers with continued growth due to developments in the wider area.
- implementation of training packages and ongoing review leads to a reduction in ASCH per student
- attrition and completion rates require a managed process.
- delivery mechanisms will be important to prevent excessive pressure on existing resources.
- blended delivery options may mean increased student numbers with less reliance on “TAFE premises”.
- increased demands on software, transport and technology updates.
- skill level of teachers needs to improve to allow for flexible approaches to fit industry requirements.
- strategic planning and constant review of data is essential to maintain a clear business focus.

The faculty team invited local industry representation onto the committee in an ongoing capacity to ensure continued industry feedback joint decision making.

Possible solutions were analysed and are summarised in Table 4

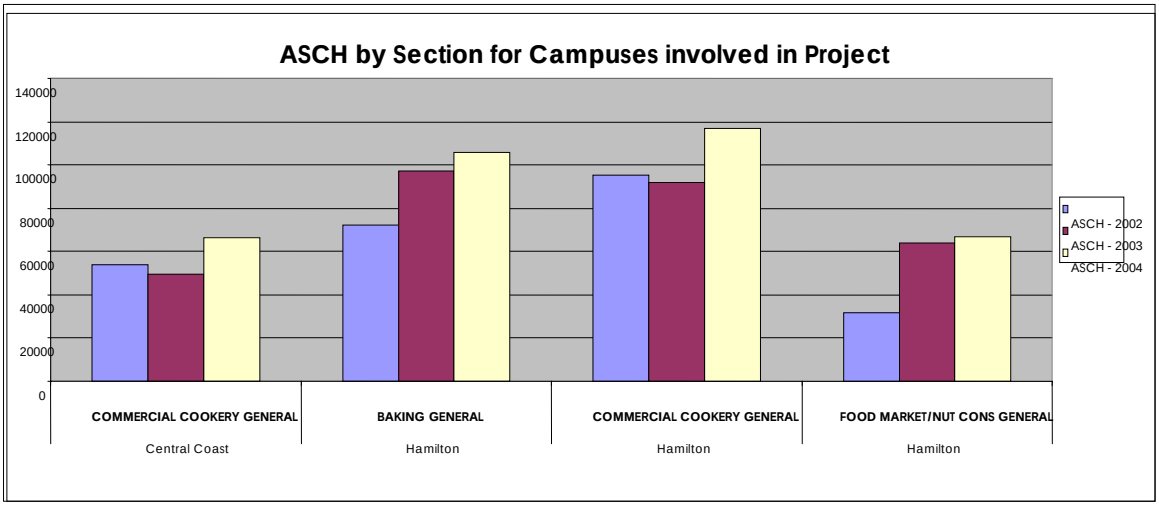
Table 4: Solutions

Solution	Details	Fulfils needs Yes/Why	Fulfils needs No/Why not?
No change			Not reflecting needs of current student population Does not reflect future needs of students May become increasingly irrelevant May lose students to private providers capable of greater flexibility
Low tech response	As above	Need to have quality assurance mechanisms	Audit shows that current methods do not guarantee quality outcomes or student satisfaction
Online Delivery	Strategic push to a higher proportion of online courses	Not necessarily appropriate to the needs of students in highly practical areas	Fulfils need of specific segments of the market but is not universal
Blended Delivery	A method of utilising the best of all the methods of delivery currently in use	A major change but one capable of delivering satisfaction to the majority of our clients. Capable of addressing all the issues from stakeholders	Staff requires different skill sets Resistance of staff to student centred model

Based on the graph below it shows that there was a need for change in strategies to ensure a more effective and efficient delivery method was implemented to meet actual student contact hours (ASCH) targets.

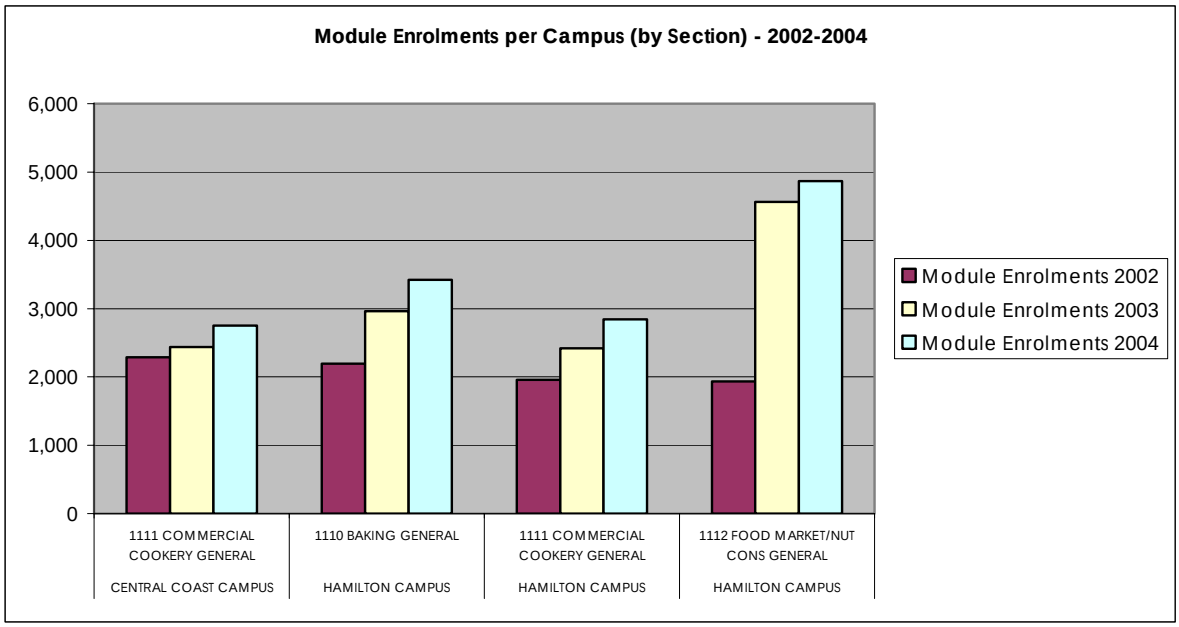
In this graph the first column reflects the year prior to the implementation of new delivery methods.

Figure 5: New delivery methods



There has been a solid improvement in results across the range of variables when blended learning models across the Institute have been implemented. In summary, there is significantly greater student satisfaction: students are more willing to enter, stay and complete their studies using a variety of delivery methods. The uptake of face-to-face, group online, and the individual learning offered through e-resource lesson content has been shown to be successful. Staff are significantly more satisfied: they are more willing to be involved in blended delivery resource development and delivery. Head teachers are more satisfied: they quote less concern over delivery costs and see blended delivery as being a cost effective solution to education management. Thirdly, local industry are greatly more satisfied: they notice their trainees and apprentices able to complete studies in expedient yet practical ways and they are proving to be competent sooner as the time it takes to master a competency skill has been reduced in a number of delivery areas. The combination of face-to-face, group online and individual e-learning appears to reinforce the competency skill in the learner's mind and behaviour faster than traditional time-serving methods of instruction. Results summaries are provided below, with commentary.

Figure 6: Enrolment improvements



This graph summarises enrolment improvements at the campuses where blended delivery have been implemented – Commercial cookery – Hamilton and Central Coast

Food Marketing – Hamilton

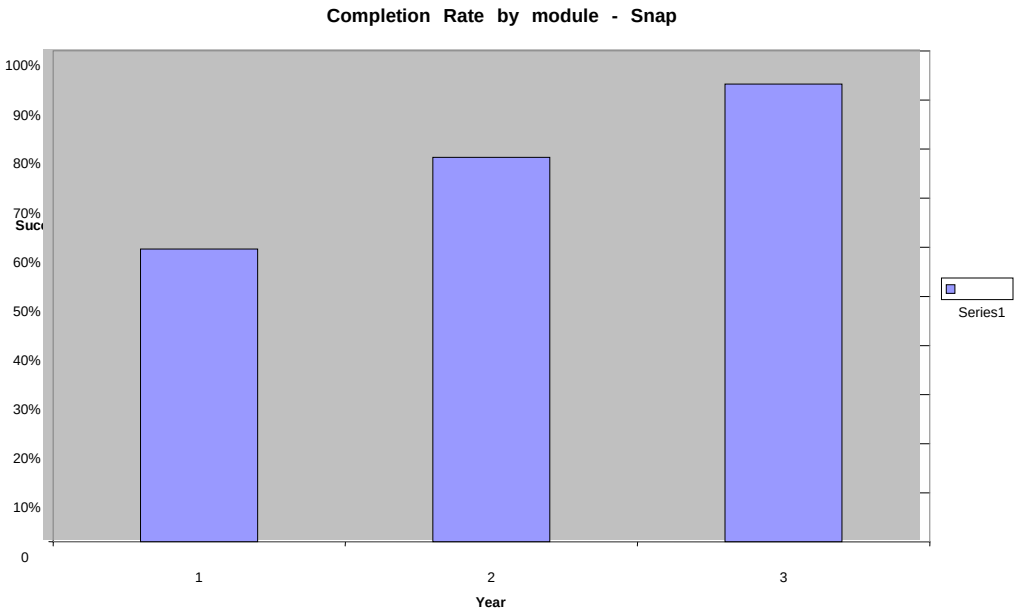
Baking - Hamilton

Student enrolment rates have improved dramatically across all campuses where blended delivery has been offered in maximum modules / units of competency.

Before project: approximately10420 module enrolments

After project: approximately 15910 module enrolments

Figure 7: Participation improvements



This graph summarises participation improvements at the campuses where blended delivery have been implemented – Commercial cookery – Hamilton and Central Coast

Food Marketing – Hamilton

Baking - Hamilton

Successful student completion rates have improved dramatically in the campus enrolments where blended delivery has been offered in maximum modules / units of competency.

Before project: approximately 60% successful completion

After project: approximately 93% successful completion

= 33% improvement.

This information shows a significant increase in student enrolment and their completion rates.

After surveying all the staff involved in the blended delivery method the students accepted this method of delivery well and the teachers had a 100% staff satisfaction. They felt that in their professional opinion the students gained enough information to meet the National Competency Standards. This provided a platform for developing a model that supported blended learning concepts, industry partnerships and shareable learning objects.

Communication strategy

The Tourism & Hospitality Faculty results are aggregated to form institute business performance measures and are reported on quarterly.

Additionally, within the faculty, the results of the Blended Delivery Internet Portal project have been communicated to students, employers, parents and staff via faculty newsletters, industry reference group forums and the faculty website.

Team members have presented their project work at TAFE NSW state wide forums and conferences and as part of Tourism & Hospitality industry network activities across NSW and Nationally.

Student/participants

As stated, the participants are all enrolled in the baking trades course. Sixty two percent of the participants are male and 38% are female. As stated below, 48% of the students are aged between 15 and 19. Of these, 81% have an apprenticeship within the industry. Our research revealed that only 3% of the workplaces these students worked had either a computer or online access for training purposes. This figure is not surprising. We have already noted that the baking industry is antiquated, and does not see its role as providing training resources within the workplace. The research showed that 0% of workplaces who responded to the question*, "Would workplace training suit your needs better and why?"* supported workplace training. Obviously, this statistic supports the view that traditional and alternative delivery modes would still need to be offered. However, TAFE needs to demonstrate to industry that investing into training and training facilities in the workplace would save time and money and assist in making the training more workplace specific.

Generally speaking, industry does not consider training a priority. If online content was available, students would have to access the information in their own time and using their own resources. The result of this is that these students are working fulltime, most working five days per week, and attending the campus one day per week. Any online delivery would have to be completed on the one day off that is available to them. We knew that this would not be a success. The blended model that would be used would have to have teacher intervention by both email, and also most vitally, face-to-face.

> *Blended learning is the most logical and natural evolution of our learning agenda. It suggests an elegant solution to the challenges of tailoring learning and development to the needs of the individual. It represents an opportunity to integrate the innovative and technological advances offered by online learning with the interaction and participation offered in the best of traditional learning. It can be supported and enhanced by using the wisdom and one-to-one contact of personal coaches.*
>
> (Thorne, 16, 2002)

Figure 8: Response by age of participants

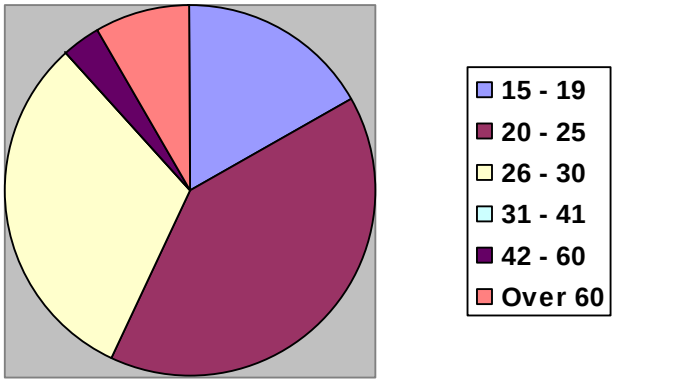
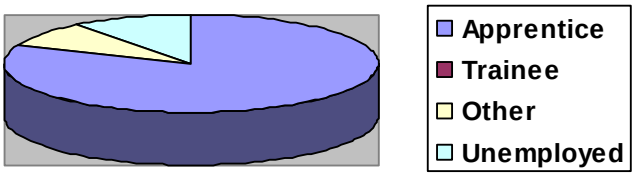
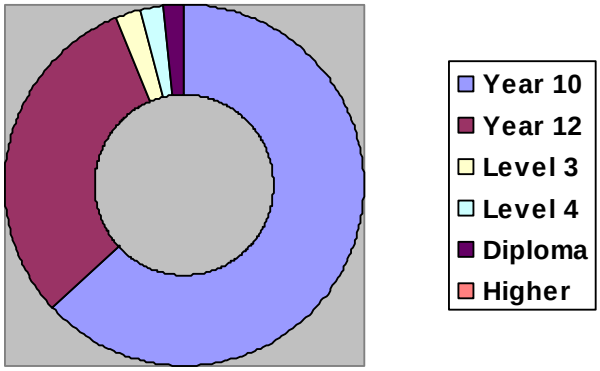


Figure 9: Response by employment



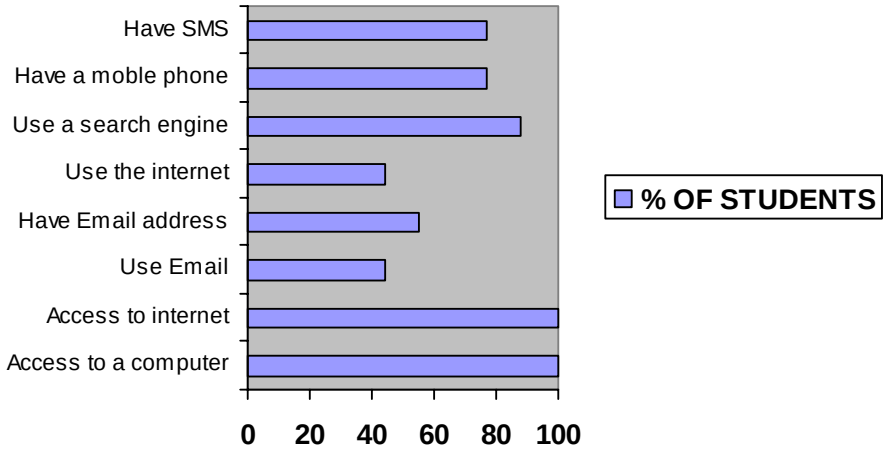
Most of the participants, 63%, had a year 10 or less educational background. The typical participant in this project is a male aged between 15 – 19 years of age. He has an apprenticeship and his workplace does not have online access and does not support workplace training. He has an educational background of year 10 or less, and will most likely have to travel to the campus for a period of three weeks each semester, away from his family and workplace. Our model would have to address all these issues.

Figure 10: Educational background



One hundred percent of the participants had access to either a computer or internet. However, only 55% had an email address and 44% felt confident using email. Seventy-seven percent had a mobile telephone and all of these had SMS and could use it.

Figure 11: Access to technology



Methodology

The research questions were:

- what learning object model best suits the needs of this flexible learner group? (Considering general literacy needs, working conditions such as night shifts and the accessibility to training)
- how can e-learning be more effectively integrated to meet the needs of this industry sector?
- how can learning materials be obtained through industry partnerships and managed to suit changing industry standards and the individual needs of teachers and students engaged in flexible learning?
- how effective are multi-media learning materials for teaching up-to-date industry standards in the baking/pastry industry?

Several strategies were used for this project:

- survey 189 employers within the baking industry (see appendix 1)
- consult with Callebaut chocolate to access multi media materials
- survey 90 students (see appendix 2)
- conduct comparison between face-to-face and hybrid groups

The first stage in this process was to access learning materials from industry. Callebaut was selected as we already had a strong partnership with the company and were aware of the resources that had been developed. A three day visit to the Barry-Callebaut factory in Singapore was organised to access their training facilities and resources. During this visit an agreement was made that we could use all resources for the development of our model. The training is conducted in a specially designed kitchen by Jean Marc from the Belgium College in tempering, casting, show pieces, and molding.

During the three days spent at the college, Dean Gibson was able to record Jean Marc whilst lecturing and captured many chocolate tempering techniques with a digital camera (750 mb).

Dean Gibson kept in touch with the team using a web log diary called choc pigs http://chocpigs.blogdrive.com/ and the TAFE email system. This at first was

very time consuming as it added two to three hours onto an already long day but was essential for this project and stands as a record for the trip there.

Resource acquisition included video footage, voice recording, new techniques in tempering, DVD History of cocoa and the story of chocolate, video footage (to be made into a resource, Continental Cakes), web links and information on equipment for chocolate specialist.

This was a unique agreement within the baking industry. Presently the relationship between TAFE and the industry is very poor. It is often stated by industry that TAFE does not deliver relevant and concise training. However, we demonstrated to Callebaut that a flexible learning model would be developed through this partnership and it was expected that the training would be workplace relevant, time saving and cheaper but more importantly, achieve a higher standard of outcome.

Literature review

Having considered the recent literature on how adults learn, we examined recent literature which focuses on vocational learning within the baking industry as opposed to the more general area of how adults learn. In a paper describing a research project completed in by Chan & Selina, *Modern Apprenticeships in the NZ Baking Industry* (2003), factors that supported New Zealand bakery apprentices in completing their National Certificate at level 4 qualifications were investigated. One of the discussion points that arose from the above project was the impact and that need for structure in flexible delivery with bakery apprentices. The paper presented by the Baking Research Industry, BRI Australia Pty Ltd, (2003) was *The Australian Baking Industry: a profile and William Angliss Institute of TAFE*, (2003) A new and innovative training environment supports these findings. There is very little research within the context of the baking industry and, in particular, models of learning for delivery in the workplace. A small number of resources that relate to the topic of chocolate that may be helpful for a practitioner who wishes to deliver within this content area could be assessed, such as the Christchurch Polytechnic Institute of Technology Te Wananga o Otautahi New Zealand (2004*) Baking Online*.

The Australian National Training Authority —ANTA— (2002a), *Knowledge Builders: fresh thinking about learners and their teachers*, *July 2002* is a collection of seven commissioned articles - called “think pieces” –intended as a resource to inspire fresh thinking and renewed conversation about teaching and learning in the vocational education and training (VET) system. Key themes that emerge from the literature include the debate about formal versus informal learning. In *Co-participation at work: Understanding learning through work,* Billett, S. (2002) proposes that whether learning arises through everyday work activities or through guided learning in workplaces, it is underpinned by workplace participatory practices, and calls for workplace learning to be discussed and evaluated on its own terms, not as a deficit model by comparison with institutional learning. He argues that workplace learning is structured by work practices and that learning outcomes are socially shaped.

Another theme identified was support of the industry in relation to workplace training and online learning which was examined by Boud, D. and Middleton, H. (2002), *Who Do We Learn from at Work?* This paper addresses the question of who is involved in learning in workplaces. It draws on semi-structured interviews with workers at four Sydney worksites within a single organisation and presents preliminary findings about how these workers find what they need to learn effectively. They found that each of the workgroups exhibited unique qualities, and presented a reappraisal of apprenticeship as a model of learning. Gonczi, A. (2002) discusses the learning and teaching of the key competencies and argues that the old learning paradigm needs to be replaced by a new one which links learners to the environment in which learning is taking place.

One of six reports produced by OVAL Research, UTS as a result of the ANTA funded project is that by Chappell, C. and Hawke, G. (2003), *An industry-led VET system: Issues for policy, practice and practitioners*. The project involved eight practitioner-researchers working in four TAFE Institutes as project partners and focussed on three industry sectors: Information Technology (IT), Tourism and Hospitality (T&H), and Manufacturing.

Key findings were: the promotion of an industry-led VET system has produced significant gains for Australian VET; increasingly local/regional relationships based on partnership and collaboration are central elements in VET program planning and delivery; and social policy objectives remain important elements in VET provision.

This report concludes that the greatly increased diversity of teaching and learning methods utilised within VET programs has developed in response to immediate pressures but has not been accompanied by any theoretical or conceptual underpinning and that a contemporary pedagogy of VET needs to be developed.

An update of a 1993 publication, Merriam, S.B. (ed.) (2001), examines the latest developments, significant research, and continuing scholarship in andragogy and self-directed learning. Articles explore a variety of frameworks, including context-based learning, informal and incidental learning, somatic learning, narrative learning and transformational learning.

Lambert, M. (2002), suggests four models of the higher education learner of the future:

- the collaborator: for whom networks of knowledge, skills and ideas are the source of learning
- the free agent: utilising flexible, continuous, open-ended and life-long styles and systems of learning to the full
- the wise analyser: able to gather, scrutinise and use evidence of effective activity and apply conclusions to new problems
- the creative synthesiser: able to connect across themes and disciplines, cross-fertilise ideas, integrate disparate concepts and create new vision and practice.

He concludes that learners of the future are likely to embody aspects of several, perhaps even all, models in their approaches to learning. Illeris, K. (2001), identifies most adult learners enter learning programs because they are more or less forced to do so as part of labour market programs, and not because of an inner drive or interest. Further, they develop a variety of psychological defence strategies to avoid learning which challenges their usual personal ways of thinking, reacting and behaving.

Development of the resource

This project was initiated when Dean Gibson approached Leigh Blackall and Donna Hensley in the Institute Teaching and Learning Innovations Unit (ITALIC) seeking support to find funds to undergo 'Return to Industry' training in Singapore. At the time Leigh Blackall was preparing a research grant application to look at ways to develop media rich learning resources more cheaply – following the shareable learning object model. Leigh Blackall saw an opportunity to include Dean Gibson's needs if he was able to negotiate industry cooperation through the provision of content for learning resource development. Dean Gibson was able to get that cooperation and so a project was scoped that would test new ideas for learning resource development, using the baking section as a test bed, and Dean Gibson's industry relations for content support.

Dean Gibson went to Singapore and underwent his training at the Callebaut chocolate factory. During his training, Dean Gibson video-recorded demonstrations, maintained a web log diary, and negotiated rights to use derivative content from the Callebaut promotional DVD.

On his return the team met to discuss the best ways to use the content Dean Gibson had collected to develop resources and flexibly deliver training to industry personnel working with chocolate.

Initial changes to the project scope

It was in this meeting that Leigh Blackall first became aware that the project focus had shifted away from resource development and more towards delivery. Leigh Blackall resisted this change arguing that such research on delivery had already been done. At this time Leigh Blackall failed to recognise that flexible delivery was a very new thing to the baking section and the industry that it supports. The section was in need of locally gathered, quantitative and qualitative evidence to support a move towards flexible delivery.

A blend of the two focal points was negotiated. The exploration of resource development though derivative works from industry content was to proceed, but the shareable learning object model for the Learning Management System (LMS) would have to go on hold. A flexible delivery (blended face-to-face and distance learning variety) of the developed resources was to be conducted and measured against the traditional face-to-face delivery. In addition to these two aspects, some participating staff and students would have to be given introductory tutorials in the use of basic internet communications technology.

Gathering Resources

Dean Gibson appeared to have no difficulty gathering resources for the development phase of the project. Callebaut Chocolate gave permission to make derivative works from their DVD for the baking section's educational use, and allowed Dean Gibson to video record demonstrations without limits.

One of the most interesting outcomes at this stage has been our relationship with Gary Willis National Sales Manager for Barry Callebaut http://www.mayers.com.au F Mayer Imports, Paul Halliwell General Manager

Callebaut Singapore and Barry Callebaut in Belgium, is that it has continued to strengthen with major outcomes from both TAFE and Callebaut.

It is impressive that a company has such foresight to invest in education by sharing resources with the baking section and work toward lifting the skills of the baking, restaurant and hospitality industry.

Gary Willis stated:

> *The initiative behind this training medium is commendable. Finally for the first time in this country students and chefs can access the latest information on chocolate and have this information relevant for Australia. For many years Australia has been behind the rest of the culinary world with regards to chocolate training. Previously chefs/students would have to venture overseas for information and training as 'local Australian' institutes just did not provide what was needed.*
>
> *One of the main philosophies behind all marketing of Callebaut is to ensure that we are also offering some thing to the industry by way of training or competitions etc. For Australia, we want to lift the market level to at least equal what is happening overseas. To be able to support Hamilton TAFE with information and training and then have this put into such an excellent training package is heading towards our goal of working with industry to improve skill level and knowledge on chocolate through out the entire industry.*

Encouraged by this support from Callebaut, Leigh Blackall contacted SBS TV to ask permission to make derivative works from their free to air program *Australian Food Lovers Guide* and although their response was positive, with the producers stating through email that they could "see no problem with the idea but would need to run it past their lawyers"... it appeared that SBS's contribution would not be timely enough for the needs of this project. In any case the Callebaut content was going to be ample.

Lesson plans to story boards

Dean Gibson wrote out lesson plans for the two deliveries and consulted with Leigh Blackall on how to develop them into documents appropriate for resource delivery. It became apparent to Leigh Blackall that with a little work the lesson plans would translate easily into treatments for the production of the resources, and Leigh Blackall proceeded to involve Dean Gibson in the initial development plans.

Leigh Blackall and Dean Gibson then spent three days going through the lesson plans, simplifying them and extracting a storyboard for the resource development. While Leigh Blackall is quite experienced in this process, this was the first time for Dean Gibson and to Dean Gibson's own admission he was having trouble perceiving the end products due to his lack of experience in this type of work and internet communications technology more generally. As a result the scripting phase took longer than it should have. Leigh Blackall's experience working with many teachers and trainers in a similar position suggests that perhaps it should not be the role of a trainer who must keep

abreast with his or her own industry developments, to know and understand the behind-the-scenes processes of media production. If the trainer could choose from a range of lesson plan templates[2], draw their plan into it, and where possible meet with the developer to simplify and evolve the plan, then it could be conceivably left to the developer to story board and script the resources based on that plan alone and only call on the trainer when content needs to be identified. Having said this however, if the trainer has experience - as Dean Gibson now does, it would almost always be better to work collaboratively with the developer at story board and script writing stages to share and evolve ideas and to comprehensively cover all aspects of the intended resource - especially content identification.

Development of resources

Due to the time frame and budget of the project, it became apparent that the development of shareable learning objects (in the sense of the model conceived for use in a LMS) was not going to be achievable. It was also apparent that the staff and students who were going to be using the resources were not at all experienced with a LMS or with the interactive demands of a content management system more generally, and so the capability of shareable learning objects was not likely to be fully exploited in the near future in the baking section.

In saying all this though there arose a different interpretation of the concept - shareable learning resources based on the current and likely future method of teaching being used in the baking section. It is obvious to say that face-to-face teaching will continue indefinitely at least in the baking section, and the traditional resources used in such a delivery (overheads and photocopied handouts) would stay the same. It was also envisaged that at least one data projector and networked computer would eventually enter the classroom, and flexible learning options would be offered to the students to some degree, likely a blended delivery mode. Many reservations remained about using the Institute's LMS and there was some interest expressed in the use of e-resources, a tool developed by Hunter Institute, as an alternative to delivery of resources online via the LMS.

With all this in mind, Leigh Blackall elected to build resources that could be shared around such a teaching and learning environment.

Shareable features of the resources include:

1 the files for print have been designed to photocopy well on both paper and acetate transparencies, and to A4 or pocket size for optional use in the kitchen or other workplace.

2 all resources are available in the library in multiple formats should computer or internet use not be viable.

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2. Along the lines of what the Illawarra Institute Teachers and Learners Resource Unit conceived in 2003 with its plan template, but perhaps without the automated features – just a range of good learning sequence templates.

3 the main digital resource is in fact one interactive media file that progressively downloads a grand total of 2.6 megabytes of content! This small file size enables the complete resource to be delivered through e-resources and/or as an attachment to email without breaking directories or links.

Other Features Include:

1. usability and accessibility - Over all ultra-simple to use online resource without the complex navigational options and features of an LMS. Resources are open and available to search engines and not hidden behind passwords or the LMS. Designed for inclusive learning under universal design principles; meaning users with disabilities are able to access this resource in the same time and place as their classmates without having to rely on exclusive assistive technology such as a screen reader.

2. a URL that is easy for students and teachers to remember and a directory structure that is ultra simple to understand.

3. no login or password required accessing the resources, including the discussion pages.

4. privately hosted files that are possible to find through a search engine (rather than hidden behind an LMS) and available for updating through a common File Transfer Protocol (FTP) program without the need for server side technologies and support.

5. original content contained in one Flash library that is clearly structured, ready for use in any shared Flash library system.

6. the use of group SMS notification is an exciting addition to the project. We used the Telstra Business Solution's Free Trial.

We asked for feedback from Greg Preston, Lecturer in Education Manager, web-based Learning and Development, School of Education, Newcastle University and some items for consideration were given:

- *ensure that the user can always move to another spot in the work i.e. from Lesson 1 back to the main menu.*
- *give some thought to having the navigation structure -outside- the Flash structure. That is having the menu etc as a fixed item into which the Flash loads. It can still be the same color etc and appear as if it is part of the animation/flash.*
- *the text on some of the flash movies can be hard to read- perhaps a different color- black maybe?*

- *the -Ken Burns effect- (zoom in/around) on the still images is useful for attracting attention but lacks impact when overused.*
- *give some thought to perhaps fading the text which is not highlighted when the text is supporting the images. At the moment you are highlighting the relevant text, however, the other text is still very clear.*

The Cost

Cost of delivery (on top of normal delivery expenses) over a period of:

3 years: $48000 hands on resources + $6000 digital resources = $54000

5 years: $80000 hands on resources + $6000 digital resources = $86000

Digital resources one off investment = $6000

Hands on resources = $16000 @ $4000 per session, @ 4 sessions a year.

At 30 enrolments per session the cost per student on top of normal fees would be around $150. At that rate the development of the digital resources would have been paid off in 3 years. At $140 per enrolment the digital resources would be paid off in 5 years.

Our preferred way of looking at the cost of developing the digital resources (which are far smaller than the cost of the hands on resources) is as a marketing and promotion investment for the course.

By making the digital resources freely available for potential enrolments to view before actually enrolling, we would expect that the institute could increase its enrolments by at least 15 - 20 people per session on the basis of them wanting the face-to-face and assessment services that the Hunter Institute offers to compliment the digital resources (blended delivery). With this point of view the $6000 to develop the digital resources is a reasonably small promotional cost when dispersed over a three - five year period.

Course content

Blended chocolate started when updating an already great resource downloaded from the ANTA Resource Generator THHADCC06B Prepare chocolate and chocolate confectionery.

http://www.resourcegenerator.gov.au/Competency.asp?View={77A6B979-6365-480D-9119-6CD2D02B3CC9

Having literally stumbled on this resource, what was impressive was the extra resources for the trainer, overheads that interlinked to the lesson plan and that could be changed electronically.

This course is designed to develop the participant's knowledge and skill in techniques and processes of handling chocolate and to prepare a range of chocolate confectionary suitable for a hotel, restaurant or coffee shop.

A bonus for the students participating in this research project was that we could give them recognition for the training they received for the email and online search training they under took in prior to the commencement of the project.

Competency Standards (C/S)

1. BSBEBUS401A/01 – Prepare self and/or others for online search
2. BSBEBUS401A/02 – Research business information
3. BSBEBUS401A/03 – Locate and retrieve information

http://www.ntis.gov.au/cgi-bin/waxhtml/~ntis2/unit.wxh?page=80&inputRef=25917&sCalledFrom=pkg

Competency Standards (C/S)

1. BSBEBUS302A/01 Access or organise electronic mail
2. BSBEBUS302A/02 Initiate and respond to electronic mail
3. BSBEBUS302a/03 Maintain housekeeping system

http://www.ntis.gov.au/cgi-bin/waxhtml/~ntis2/unit.wxh?page=80&inputRef=25916&sCalledFrom=pkg

Training was done for the email/online search component by verbal instruction, an assessment task and written instructions. The layout of library computers and the fact that other students are also using them makes it difficult to use any other methods.

Although reluctant to use any technology, the participants all approached the tasks and completed them all without too much drama. Even two who said they had never used computers managed to follow the instruction sheet. All were able to listen to the instruction and do the assessment on e-resources, but many wanted verbal instructions on email, rather than reading from the work sheets. Again, many expressed dissatisfaction with having to use computers and were put off by two, typed instruction sheets.

All classes were surveyed on using technologies like email and SMS which we would be using during the project. With some classes of 12 only having three with email addresses the team decided to invite Dianne Davis, the campus Librarian, who named our site “blended chocolate”, blended being the delivery mode.

During a meeting with Dianne we decided to train all students using the hybrid delivery in the library and for each student to set up an email account. This training was delivered by Dianne.

Training the trainer

Dean Tilden is a part-time pastry teacher at Hamilton and was nominated for this task as he had no chocolate training, limited knowledge on e-resources including using a Light Pro, the Institute’s LMS and using technology like the internet to help deliver and support training. His biggest asset, however, was his enthusiasm and ability to learn a lot of chocolate content and technological tools in a short period of time, most of which was done without guidance.

Thirty hours were allocated and used to train Dean Tilden in chocolate tempering and the blended chocolate content.

Dianne Davis was responsible in training Dean Tilden in using all e-resources he would need to use during the project, most of which was done during the semester break.

Delivery

The content was delivered over 3 x 2 hour lessons (see appendix 3). The content for both the face-to-face and hybrid groups was identical. For both groups, a pre-assessment was conducted to identify current knowledge of the content. The average mark gained for both groups was 30% (see Figure 10). This was expected, as none of the participants had any experience in this content area.

Table 12: Theory assessment comparative data

	Pre assessment %	*Pre post assessment %*	*Mid post assessment %*	*Post assessment %*
Face-to-face	30.28	N/A	42.5	56
Hybrid	30.57	33	60	66

Table 13: Resource use

Hybrid

	Receive SMS	*Receive email*	*Follow emails directions*	*Use Website*	*Workplace practice*	*Use BLOG*
Week 1	83%	36%	23%	23%	N/A	N/A
Week 2	54%	30%	30%	57%	88%	6%
Week 3	56%	42%	31%	63%	N/A	8%

Face-to-face

Forty-five students participated in the face-to-face component. A pre-assessment was conducted to establish the participants' prior knowledge (see appendix 4). All content was delivered within the classroom. The method used reflected the style of delivery currently employed for all baking trade classes. Teacher centred demonstrations were the only form of delivery. Basic text base handouts were used. The full nominal hours were used.

Hybrid

Forty-five students participated in the hybrid component. A pre-assessment was conducted to establish the participants' prior knowledge (see appendix 4).

All content was delivered through the website, www.blendedchocolate.com. The students received instructions using SMS and email, directing them to tasks and information. Some level of prior knowledge was expected before coming to class, allowing for less face-to-face time. The students also had access to the Callebaut DVD, suggested textbooks and websites. The students were also given their teachers email address to ask questions and clarify any issues.

TIMELINE

Pre delivery

Handout

Email notice, notification to expect an email message (see Appendix 5)

SMS

Reminder to check email

Email

Introduction – inviting the participants to visit the site and complete tasks

Online

Website www.blendedchocolate.com

At this point the hybrid participants have had no teacher contact. Eighty-three of the participants had received and read the SMS (see Table 13), reminding them to access, read and follow the directions of an email that had been sent to them. Thirty-six percent said they received the email. Twenty-three percent followed the directions to the website, of these, 100% accessed and used the website (see Table 13). Reasons given for not following the SMS message;

I was too busy

Could not get to a computer

Did not understand the message

This means in total, 23% of the participants had followed all directions without any teacher intervention or contact. Obviously the outcomes were very poor and expected. This group of students do not have the skills, support or time to achieve competency if all content delivered is self-paced and online. We were certain that teacher intervention would improve the outcomes and the student participation online. A number of studies (see Brennan 2000; Cashion and Palmieri 2002; Grace 2001) have identified skills required for tertiary study. These skills, I suggest, are vital for any study mode, but become particularly significant when learners are distanced from immediate, ongoing face-to-face support.

Study skills recognized as vitally important for flexible and blended education are:

- high levels of independence
- motivation
- persistence
- literacy
- computer skills and experience
- time management

Lesson 1

Pre/post assessment – We found that the average mark for the pre-assessment was 30% (see Table 12). The low result was expected as the students had no prior knowledge of the content. However, as identified, 23% of participants had followed all directions and used the resources as suggested and the average mark for the pre/post assessment had increased to 33% (see Table 12). At this stage, there was still no teacher intervention

At this point, the content of the lesson plan (see appendix 3) was delivered to both groups. In the hybrid classes; the website, Callebaut training DVD, over heads, books, and the teacher, were all available for use. In the face-to-face class, content was delivered purely to reflect the current delivery modes within this industry. Teacher-centred and the use of limited resources.

Lesson 2

SMS

Reminder to check email

Email

Go to Lesson 1 (Intro to working with chocolate)

- Watch Tempering and Molding Chocolate
- Homework – chocolate production

Online

Website: www.blendedchocolate.com

Fifty-four percent of the participants received or read their SMS and only 30% had received the email (see Table 13). Again, of these, 100% followed the directions in the email. Interestingly, 57% of the entire group accessed and used the website in preparation for the second week. A shift in culture is already starting to appear. This represents an increase of 40% of participants who accessed the online component. This was very encouraging. If this trend continued, it could be demonstrate to industry that if their apprentices had online access in the workplace, it would be used.

When the results of the assessments were compared, the trend continued. The face-to-face group increased their average mark from 30% in the pre-assessment to 42.5% in the mid post-assessment (see Table 12). The hybrid group had an average mark of 30% in the pre-assessment, 33% in the pre post-assessment and now had increased to 60% in the mid post-assessment (see Table 12). A very encouraging trend was appearing. The participants were using the resources in increasing numbers, outside of the TAFE environment, and their average assessment marks had improved by 30%. The face-to-face groups had increased their average marks by 12.5%.

The hybrid group was asked to complete workplace practice of the tasks delivered on the website. Each student was given a container of chocolate, an ice-cube tray and instructions. These included instructions were on the website they would find demonstrations on the task at hand. This was a self-paced task

so as to give opportunity of reinforcement of skills learnt. Of the entire group, 88% of the participants returned in week two with their completed task (see Table 13). This was a remarkable result. Again, we can use this example to demonstrate to industry that a combination of relevant resources, and workplace delivered content appears to improve the motivation and interest of the students.

Lesson 3

Email -

Go to Web Links to retrieve information and report to BLOG

SMS

Direct to BLOG for feedback

BLOG

Feedback

Online

View assessment

Again the trend continued. Sixty-three percent of the hybrid class accessed or used the website (see Table 13). While this does not seem a large percentage of the class, we must remember that none of the participants have online access in the workplace. This is the first time that any of the participants have had online content delivered to them in their trade course. If we can develop a training culture within the industry, we are certain that this model can be applied to deliver successful outcomes.

The post-assessment delivered the same results. The face-to-face class had an average mark of 56% (see Table 12), an increase of 13.5%. The hybrid class had an average mark of 66% (see Table 12), an increase of 6%. Over the three week period of the trial, the face-to-face class increased its average mark from 30.28% to 56%, a pleasing result. The hybrid class increased its average mark from 30.57% to 66%. A good reflection that the model that was used would provide better outcomes than that of traditional face-to-face practices.

While the theory assessments were an important tool to measure that learning had taken place, this was a practical subject that was being undertaken. The most important aspect of this research was whether practical skills could be improved by using the model. For lesson 3, the participants from both groups were asked to produce filled chocolates in an assessment style environment. All eight classes were given a code, A – H, and each student a number. The students then placed their finished products on a grid to correspond with their given code. This practice was implemented so as the assessors could not identify which products were from a face-to-face class and which were from a hybrid class. At the end of week 3, all finished products were assessed by an independent expert. The results reinforced the trend that occurred. The average

mark for the face-to-face students for their finished products was 57%. Again, this is a pleasing result. The average mark for the hybrid students was 70%. A fantastic result that reflects the outcomes from the theory component. When we total the marks from both the theory and practical components for a final percentage, the face-to-face group achieved 56.8%, while the hybrid students achieved 69.2%. A fantastic reflection that the model can produce a higher level of learning.

Findings

In this age, students need to be entertained whilst learning. Tasks should be interesting, work related and worthwhile to get them engaged. Leigh Blackall makes this statement that sums it up, “We need to exploit the talents of more professionals and capture the charm contained in things like the DVD, Iron Chef, and Aust Food Lovers Guild. Not just text books, photocopied course notes and hand outs, but charm, industry pride, coolness, off beat, stuff like that … a new type of infotainment”. A new culture of learning will have to be developed to capture this change. No longer can we expect learners to be enthusiastic about sitting in a classroom. Learning must be delivered in a relevant and self-paced fashion. As educators, we now have means of communicating with our students at any time. SMS, email, BLOGS, forums and chat represent an opportunity for dialogue with apprentices outside of the traditional learning environment. This represents an opportunity to deliver content in the most relevant environment for the student, the workplace.

As noted, the baking industry will need to research and then embrace this change. This project has demonstrated that by forming partnerships with industry bodies to share and develop resources, outcomes will be improved. A formalised training culture needs to be introduced. Training that occurs in the workplace must be recognised, and resources must be developed to reinforce that training. No longer can apprentices be viewed as ‘cheap labour’ and TAFE be considered a ‘waste of time’. TAFE must lead by example! By forming MOUs with companies such as Callebaut, opportunities for both parties have emerged. For Callebaut, improved sales in the Hunter region, this was an unforseen and positive business outcome. A new generation of bakers now know the brand name from using the website. Callebaut now have access to a resource they themselves can use for training purposes.

For the Hunter Institute, we have a resource that can be delivered anywhere in the world. An entire new market has opened for us. Opportunities to form similar partnerships with other industry bodies have now surfaced. Once it can be shown to industry that this model can reduce face-to-face hours, facilitate the training in being workplace relevant, and improve sales; most industry bodies are keen to listen. If we approach the baking industry to discuss improving training standards for apprentices, most are not interested in discussing the issues. However, if we can promise reduced hours, improved results and increased sales by sharing resources and investing in training environments, most bodies are keen to look at the opportunities. Already two of the largest employers within the industry have seen what we have done and have approached the Hunter Institute to develop similar resources.

The team-based approach to this project and the meetings involved, provides a central forum for reflection to occur and has allowed interested persons to expand personal goal horizons and disseminate these skills to other staff.

The successes of the blended delivery project have attracted interest from other providers and TAFE Institutes around the state. Team members have shared their learning at hospitality network forums within the Hunter region. Team learning has been encouraged for all staff involved in the project. As a result,

staff have participated in Introduction to Teaching Online (ITTO) training and have attended Institute team sharing days.

Other teaching sections from Hunter Institute faculties have consulted with the project team about directions for blended delivery and regular staff meetings ensure that staff exchange ideas and information gathered from networking and attending training.

Most importantly, there has been a continuous improvement and extension of industry ownership. This has been driven by local industry's assessment of blended delivery as a worthwhile and credible approach to learning. This adds to the strong support the project has received from the Institute educational development Teaching and Learning Innovations Unit (ITALIC) team.

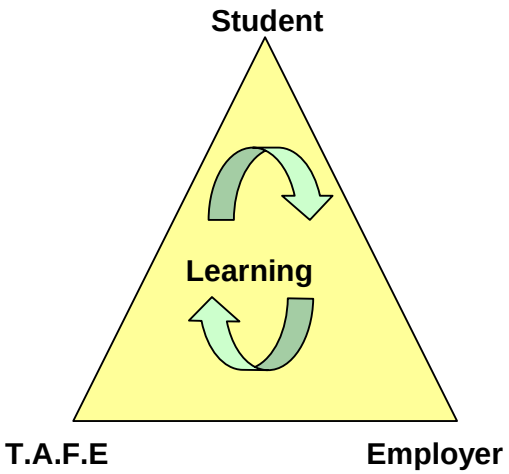
The blended delivery model developed and the team's commitment to continuous improvement continue to capture the creativity, vitality and potential of both the staff and trainee hospitality workers of the Hunter region. In the blended delivery environment learners are developing into confident and competent industry workers.

The model developed will need to allow delivery of successful qualitative outcomes in a range of learning environments. The model needs to include teacher support files, learner navigation tools that are easy to handle and a wide range of resource materials that allow for individual learning styles, learner preferences and access to materials in a wide range of circumstances.

Existing faculty delivery model

The concept of blended delivery grew from an analysis of student data and anecdotal evidence of a separation of learning on-the-job and off-the-job. It was felt that the communication process between all parties in the learning, employer, student and RTO needed to be improved. An initial meeting held with industry representatives at the beginning of 2002 started a pilot in cookery with three groups. The following model was developed initially and strong support systems were put into place to ensure successful outcomes. All parties within the process were involved in the feedback loop and fine tuning is occurring at the end of each semester. The attendance has been reduced to allow for on-the-job delivery of the required competencies. The teachers are visiting the workplace to familiarise the employer with the training needs and how they can be covered based on the existing menu provision.

Figure 14: Blended delivery model



Teaching context

The three main areas of learning environments that are encountered within the VET system are:

Table 15: Teaching context

Face-to-face teaching and learning	Hybrid teaching and learning	Distance teaching and learning
Traditional delivery style with focus on the interaction between the learner and teacher. This is used both in institutionalised context with an RTO, as well as in the workplace with the trainer/employer, showing competency requirements to the student. Often teacher focussed.	A mixture of direct teacher contact, access to learner resources, workplace learning, libraries and other learning support. This is often referred to as flexible, mixed mode or blended delivery.	The learner has access to the teacher/trainer via the internet, videoconference, mail or other means of contact. No direct contact is established and it requires a wide range of support mechanisms, learner discipline and strong systems to enable successful outcomes. Facilitation skills are essential.

Resource requirements

Resources and knowledge can be obtained in a wide range of formats. Resources need to reflect the actual learning needs of the student and should be selected to maximise exposure of the learner to the required knowledge base. The final resource package should incorporate a wide mixture of information, thus allowing the assimilation of industry relevant knowledge, clear guidance in regards to the required study tasks, opportunities to explore additional learning and involvement of all stakeholders in the learner progress. The shareable learning platform forms the base that underpins the learning model and the resources linking them to enable optimal outcomes for the students whilst tracking their progress.

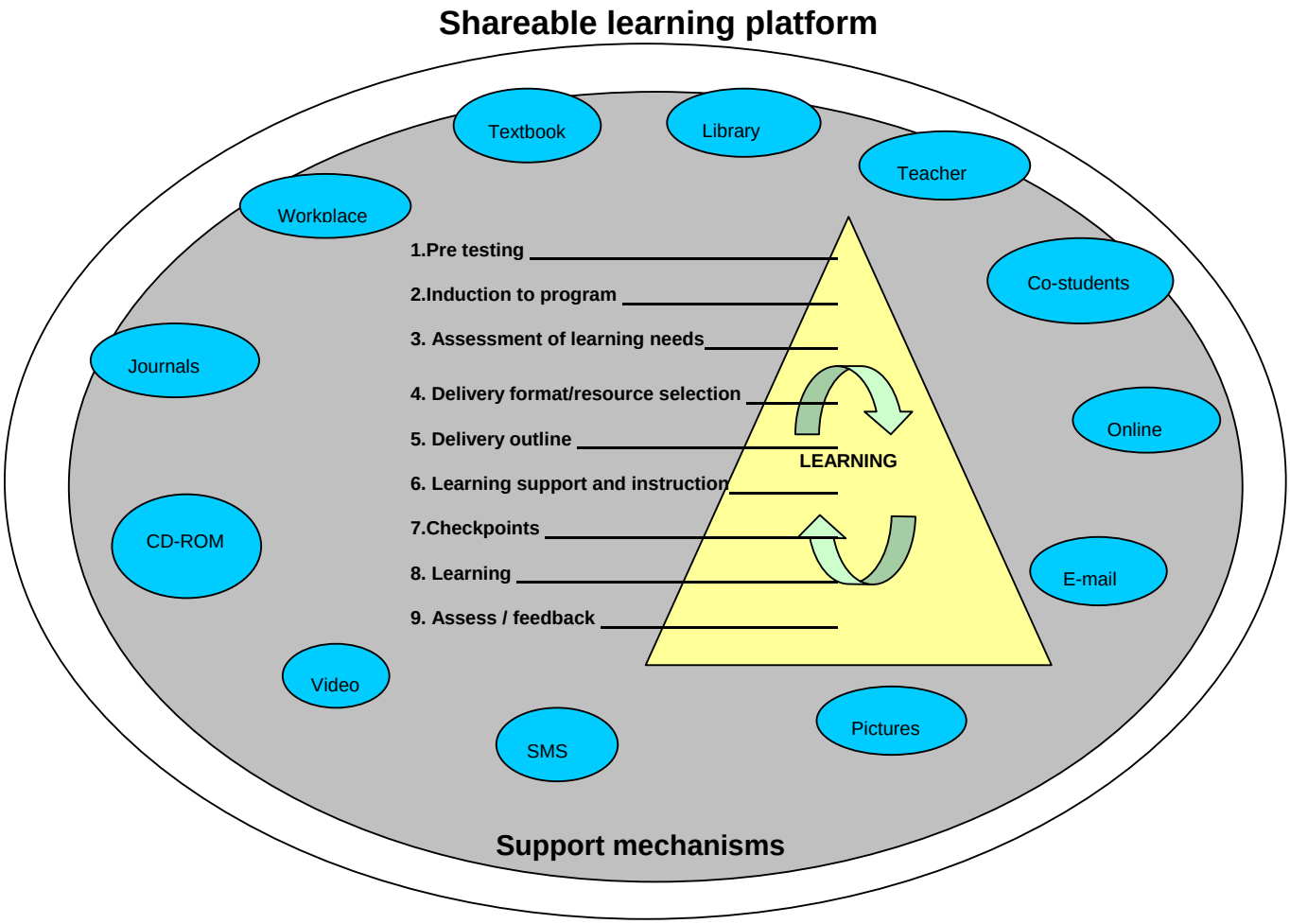
The issue of ownership and responsibilities of all parties in the process needs to be outlined within the proposed model and guidance needs to be provided for the trainer, learner and workplace to maximise outcomes. The finalised model should allow for a clear instructional path beginning with an assessment of the existing skill level, exploration opportunities for appropriate resources and the context framework in which the learner and trainer live. As the learner, facilitator and industry in this environment often have a limited amount of computer knowledge, the interface, learning objects and tools need to be simple, intuitive and relevant. Tracking mechanisms within the program will allow the facilitator and learner to adapt their progress to maximise achievement and depth of learning.

Support tools

Table 16: Support tools

Rescue	Section where both learners and teachers can receive guidance in regards to required resources or knowledge
Resource box	Listing of all resources for the module
Glossary	Clarification of all related terminology
Self tests	Support formative learning
Chat room	Supports learner and teacher interaction
Email	Allows permanent access for all parties in the learning process
Computer corner	Tips for novice users with print screen tips
Time out	Time slots when students can access teacher

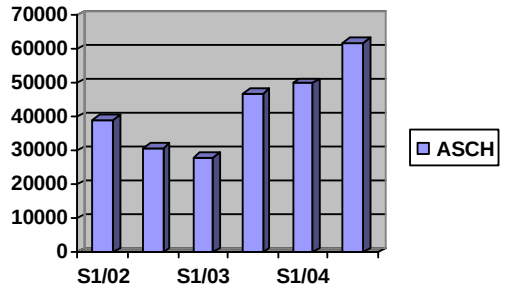
Figure 17: Integrated learning model



Implications for Hunter Institute

The baking section in the Hunter Institute has strong industry partnerships with Callebaut, Baker's Delight, Sara Lee, Goodman Fielder, Woolworth's, Cole's and Brumbies. As you can see from the ASCH growth over the past three years, these industry partnerships have meant a steady increase in delivery hours. The baking trades section at Hamilton is now delivering the largest amount of hours within New South Wales. By forming these partnerships, we have been able to access relevant resources, information and equipment that other wise would not have been used in the training of apprentices.

Figure 18: ASCH



It is suggested that the Institute supports these partnerships by:

- investing in the development of online resources for the delivery in the workplace for trade courses. As demonstrated, industry will share information and support the development of such resources if we can demonstrate that the training that is delivered is both relevant and cost effective. The large sections of the baking industry have training material that TAFE could never afford to develop. Large sections of the baking sector i.e. Woolworth's and Goodman Fielder are RTOs. They have developed resources for their training requirements. By using these already developed resources and sharing the information between each other, we would have a far more effective model for delivery than what is currently in place.
- develop resources that are free for use. The website www.blendedchocolate.com is available for anyone to use, free of charge. Not only is it a training tool, but it is also a marketing tool. Callebaut has stated, since the relationship has been forged with the Hunter Institute, sales for their products have increased by over 300% in the region. If we use this resource wisely, we can market our brand name internationally. We have demonstrated that the best outcomes for this style of delivery are a blended model. The website alone, while a fantastic tool, will have best outcomes when delivered with a variety of other resources. Anyone can access the site, as we do not own the

information of how to temper chocolate. What we do have, is a capacity for assessment and recognition. We can use such resources to attract customers who require skill gap training and assessment thus reducing our face-to-face delivery and our costs.

- invest in staff development. This model is not teacher centred. It was identified that the students who are attracted to this industry have a relative low level of education. We are certain that if all formalised training was conducted in the workplace, with no teacher intervention, the training would ground to a halt very quickly. We recommend that the institute invest in developing the skills of its educational staff in both the development of online resources and more importantly, the delivery of these resources for effective workplace training. The model has been designed to encourage the use of a variety of resources that are relevant to the individual learner. The entire educational faculty must begin to appreciate that teacher-centred learning for apprentices can be delivered far more effectively by using the technology that this generation of students uses for entertainment.
- network access in practical areas. If we are to develop such resources, we must provide students and teachers with access to online material, including assessment within all practical classrooms.

Implications for the VET system

It would be difficult to make a general statement that this project can reflect what is needed in the entire VET system. This model was developed to address a problem that was identified in one particular industry. There are, however, two implications that should be addressed by the wider VET system, especially trades areas.

- industry partnerships. Forming MOUs with major industry bodies is vital for a strong relationship on many levels. It is a formalised agreement that is signed that gives kudos to the understanding the quality training will take place and this training is considered an important investment. These partnerships allow VET to identify what it is that industry requires from training. It gives the industry bodies an opportunity to contribute to the training cycle. It also allows VET to use the resources that have been developed to assist in making the content that is delivered workplace relevant. Of course a lot of Institutes and industry guard their intellectual property jealously, so this would need to be negotiated on an individual basis. Insuring that dual brand names are used and recognition given for content that is used are important issues to address. In this environment of reduced financial resources for the VET system, industry partnerships can also lead to sponsorship of equipment. Once again, it is important to ensure that the training that is delivered is workplace relevant.
- Free content. This must be addressed by the VET system. The Hunter Institute does not own the information on how to temper chocolate, how to change a car tyre, how to connect a gas line or any other content that is delivered in our courses. If we form industry partnerships, we will not own the pictures and videos that have been developed by that industry body. We must use the model that has been suggested as a tool to improve training and market ourselves as both a training and assessment organisation. The website can be viewed by anyone. However, to gain recognition for the skills learnt, a training organisation must be contacted for assessment. This is where our role changes. Industry must take on the role of training apprentices seriously by investing in training facilities. It must work with the VET system to develop resources that are available to everyone. This is offering choice to our customers. Some learners are happy to access a campus and receive training in a traditional environment; however, increasingly, our customers are telling us that this no longer meets their needs. Our role might be that of assessing, skill gap training and resource development only. This is a huge shift for some VET system industries, baking included. If we are serious about meeting the needs of our customers, the possibilities of technology must be embraced and the mindset that we own information must be questioned.

Conclusion

The developer considers this project a success in the following areas:

1. it provided an opportunity to test and refine concepts that had been propagating out of the Institute's former ITALIC unit over the previous year, in particular, the Accessible Rich Media Project[3], and general ITALIC resource production values such as the reusable learning object model[4].

2. all staff who have been involved in this project have shown a high level of interest, commitment, enthusiasm, and openness helping those involved more clearly consider what they are doing and learn appropriate and new skills.

3. the resource production was afforded a great deal of freedom from both the industry partner and the project management, and as a result, a high quality resource was developed that proposes new ideas for simultaneous course, Institute, and industry promotion through an Open Course Ware approach to delivery[5].

Below are individual reflections on:

<u>The pilot implementation of the integrated learning model</u>

> *The experience of building the online portal has varied depending on the stage of development concerned. The experience, for me, has ranged from moments of solitary concentration on the task, to periods of marketing the concept to the troops in order to win as much support for the concept as possible.*
>
> *At every opportunity I explained the benefits of the technology and how it could be used to benefit all the stakeholders (I hate that word), not just the organisation, not just the students but the teachers as well.*
>
> *All this required a vision of what is possible. At first merely coming to terms with the complexity of the technology was a major hurdle, but as the capability of the software became clearer, progress improved.*

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3. A staff training project looking at ways in which interactive learning resources can best meet the needs of learners with disabilities. www.accessiblerichmedia.com

4 Initially this concept (as it is commonly understood in the Learning Management Systems way of thinking) was to be explored, but for various reasons a far simpler, more pragmatic and realistic approach was taken that may be an interesting development to the model. For more information, read the 'Development of Resources' section of this report.

5 Inspired by the MIT OpenCourseWare model researched by the Institute Learnscope04 project, OpenCourseWare, and as a result of complex and inefficient processes in the Institute, the resources were delivered from a registered domain and private host making them open to the WWW.

A major concern was for the portal to be not only functional but to have a real graphic appeal in order to enhance its marketing function. It was always envisioned that it would become the basic way that students accessed their online courses for the Faculty of Tourism and Hospitality in the Hunter Region.

The Big Picture on the integrated learning model

In my professional opinion the students gained enough information on these modules using the Internet portal and face-to-face activities to yield positive results

Online component was a positive tool

Not suitable for some students with specific learning difficulties

I personally find that the students are more receptive

Great for students that missed classes as they can make up missed work in their own time

Students responded well to the video clips and animation to get the point across

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APPENDIX 1

Q.1 Where did you hear about the course? **[CIRCLE ONE OR MORE ANSWERS]**

1	Word of mouth	3	Advertisement	5	Institute Course Guide
2	Mailout/brochure/flyer	4	Employment Agency	6	Other (specify)

Q.2 On a scale of 1 to 5 where **1 is Very Dissatisfied and 5 is Very Satisfied**, how would you rate this program in terms of the following:

[CROSS ONE NUMBER FOR EACH AREA]	Very Dissatisfied	Dissatisfied	Neutral	Satisfied	Very Satisfied
How easily you obtained information about the course	1	2	3	4	5
The course information you received	1	2	3	4	5
Standard of delivery of content	1	2	3	4	5
Standard of presentation	1	2	3	4	5
Standard of manuals and handouts	1	2	3	4	5
Standard of the equipment used in the course	1	2	3	4	5
Standard of teaching resources	1	2	3	4	5
Course duration	1	2	3	4	5
The overall content of blendedchocolate.com	1	2	3	4	5

Q.3Would workplace training suit your needs better and why?

Q.4Do you have Internet access in the workplace? YES NO

Q.5 Did you access www.blendedchocolate? YES NO

APPENDIX 2

To help us understand how we can provide better education and training through the use of technology, please answer these questions?

1. Do you have access to a computer?	Yes / No
2. Are you able to access the Internet?	Yes / No
3. Do you use email?	Yes / No
4. Can you handle attachments with email?	Yes / No
5. Do you have an email address that we can send to? Please provide it.	Yes / No
6. Do you use the Internet much?	Yes / No
7. Can you use a searching program like google.com?	Yes / No
8. Do you have a mobile phone?	Yes / No
9. Do you use SMS?	Yes / No
10. Do you mind if we email and SMS you sometimes?	Yes / No

Comments _____

_____

Signed _____ Date _____

Print name _____

Mobile_____

Email address_____

TAFE NSW & the Department of Education & Training will use the information provided by you on this form for the purpose of communication within this course only. The information will be held securely. You may change details at any time by contacting your teacher.

APPENDIX 3

What you should achieve

element	**performance criteria**
On completion of this unit your Trainee should be able to:	You will know they have achieved this when they can: (tick when completed)
Element 1 Temper couverture	❑ Melt and temper couverture using the correct method and the correct temperatures. ❑ Manipulate couverture to the correct viscosity and desired flow properties and to possess appropriate colour, gloss and snap characteristics on solidification. ❑ Control the temperature to retain workable consistency.

Lesson 1 activities

1. chocolate terminology	Page: 4
2. Cocoa butter, the critical component (Demo)	Page: 8
3. Magnum test	Page: 8
4. Temperatures worth remembering	Page: 10
5. Addition and table method (Demo)	Page: 12
6. Moulding and casting chocolate (Demo)	Page: 13
7. Hybrid blendedchocolate.com	Page: 13

(add simplified outcomes)

Intro **The story of cocoa** **The cocoa bean** Raw materials for cocoa • Central and South America • West Africa • South East Asia **Cocoa tree to cocoa beans** • Fermentation process • Drying and storage	**Hand out pre assessment** Explain/discussion White board Provide stats/OHT White board OHT 1 OHT 2	**Hand out pre assessment** Watch DVD 30 minutes Origin of cocoa DVD - Cocoa tree - Cocoa pods - Split pods	Website/email link/library Cut version of DVD DVD available in library Origin of cocoa e/resources - Cocoa tree - Cocoa pods - Split pods

Process of Cocoa to ingredients for chocolate Cocoa beans provide the three main components for chocolate production • Cocoa mass/Cocoa liqueur • Cocoa butter • Cocoa powder/by product **Cocoa bean to cocoa mass** • Cleaning and roasting process De shelling and grinding of the cocoa mass	OHT 3 -Flow chart of process	DVD - Beans broken - Cocoa nibs - Liqueur/Butter/Cake - By product Cocoa powder	e/resources - Beans broken - Cocoa nibs - Liqueur/Butter/Cake - By product Cocoa powder
Chocolate making process/ mixing • Cocoa mass • Cocoa butter • Sugar • Milk powder • Emulsifier • Vanilla **Fine rolling and Conching** Flavour development Smoothness and mouth feel	OHT 4 **Show ingredients (see setup)** OHT 5	DVD - Chocolate dough - Conching - Addition of cocoa butter - Chocolate liquid - Setting in blocks Hand out map-stats of production Hand out flowchart/process	e/resources - Chocolate dough - Conching - Addition of cocoa butter - Chocolate liquid - Setting in blocks map-stats of production flowchart/process
What is Couverture **the higher the fat in chocolate results in:** Better melting characteristics A more brittle break or snap A more liquid chocolate "viscosity" A more expensive chocolate The difference between couverture and compound chocolate Trade language/ legal commodity % cocoa butter	White board OHT 5 **Show ingredients (see setup)**	Web/light pro Couverture has 5 main ingredients What is couverture **Show ingredients (see setup)**	e/resources Couverture has 5 main ingredients What is couverture

ACTIVITY 1 Introduce Trainees to each of the terms, encourage questions, and ask Trainees to familiarize themselves with these terms and apply where appropriate. Encourage use of terms in future discussions.	**Chocolate terminology** White board/OHT **Cocoa butter-**OHT8 taste **Cocoa nib** Taste **Couverture** Taste **Enrobe to -** Show enrobe **Fat Bloom –** Show describe **Ganache –** Show cake covered. **Snap –** Taste **Sugar Bloom –** show bloomed chocolate **Tempering –** explain **Compound Chocolate –**Taste	**Chocolate terminology** Light pro/Available to print Taste-e/resources-cocoa butter taste Taste Show enrober e/resources fat bloom photo of cake-e/resources video4 0.44.45.05 e/resource- Sugar bloom e/resources-what is tempering Taste	**Chocolate terminology** Available as a print Cocoa butter e/resource- Sugar bloom e/resources-what is tempering Applications/tempering/callets
Equipment for tempering Chocolate Advise Trainees on the equipment required and explain each and its function: a device, preferably thermostatically controlled, where air or water warms a container with chocolate suitable thermometers A suitable thick slab (marble, granite, slate, etc.) non-porous stirrers, spreading tools (spatula, scraper, crank-handled palette)	Show	show	

Tempering/ Crystallizing chocolate Explain that tempering is the technique which controls the formation of cocoa butter seed crystals which start the solidification process when final cooling is applied. This is achieved by putting liquid chocolate through a distinct temperature cycle of heating and cooling Of these two methods three factors are critical • **Temperature** • **Time** • **Movement** If one of these is missing it is impossible to temper the chocolate. The main purpose of tempering chocolate is to obtain the smallest possible crystal.	OHT6 <u>White board</u> -Like cement OHT 10 <u>White board</u> Of these two methods three factors are critical • Temperatur e • Time • Movement	light pro e/resource- what is tempering e/resource- what is tempering	e/resource- what is tempering e/resource- what is tempering
How does tempering work? Dry cocoa particles and the finely ground sugar are very evenly dispersed in the liquid cocoa butter.	OHT 10	e/resource- what is tempering	e/resource- what is tempering
Cocoa butter controls whether the chocolate is in a solid or liquid state in other words it controls the melting and setting of chocolate. Sugar and dry cocoa particles - are inactive. They are the passive flavour carriers.	OHT 10 <u>White board</u> x o x o x o x o x o x o x o x o x o x o x o x o x o x	e/resource –cocoa butter link/video	e/resource –cocoa butter link/video
Cocoa butter reacts to temperature, when chocolate is heated to above 33°C, the cocoa butter will liquefy and that the evenly arranged dry cocoa and sugar particles will now float freely. The heavier particles will	OHT 10 <u>White board</u>	e/resource- what is tempering	e/resource- what is tempering

liquid cocoa butter, having a smaller specific weight, will float on top “fat bloom”	x o o o x o x o x o xx o x x o o o o		
The aim of tempering chocolate is to re-unite and evenly distribute all of its components and that this can be achieved by two tempering methods addition and table.	OHT 10 Addition method Table method	e/resource- what is tempering e/resources-tempering methods/table method /injection method	e/resource- what is tempering
Of both method used, the chocolate must show a noticeable thickening, the indicator that all particles are bound together.	OHT 10	e/resource- what is tempering	e/resource- what is tempering
ACTIVITY 2 ***Cocoa Butter – The critical component*** Cocoa butter is the natural fat of the cocoa bean. An understanding of cocoa butter and its various forms is vital to successfully temper chocolate. Cocoa butter is what controls the melting and setting of chocolate. Think of this ingredient like cement that sets the chocolate except it is **temperature, heat** and **movement** that will crystallise the cocoa butter.	OHT 7 **Demonstration of crystallizing cocoa butter table method**	e/resource- what is tempering **Demonstration of crystallizing cocoa butter table method**	e/resource- what is tempering
ACTIVITY 3 **Magnum test** Look at the ingredients on the back of the wrapper and you will notice that it has 2 of	Hand out mini magnum	Hand out mini magnum	e/resource- Magnum test

the main ingredients of couverture chocolate; cocoa mass and cocoa butter. Put the magnum into your mouth and just work your tongue back and forth and the chocolate coating will start to melt. The complete melting point is just below body (blood) temperature (37°C) so the cocoa butter in the chocolate coating has a melting point lower than your mouth temp.			
ACTIVITY 4 Temperatures worth remembering. Trainee prepares a **little pocket chart** for use when working with chocolate.	Temperatures worth remembering Printout OHT Thermo with temperatures	e/resources-temperatures worth remembering Available as printout	e/resources-temperatures worth remembering Available as printout
Tempering methods As cocoa butter is the critical component the three points are paramount to success • Time • Movement • Temperature	White board Important points	e/resources-tempering methods	e/resources-tempering methods
Tabling on marble surface This method involves 2/3 of the melted chocolate being poured onto a cooling table or marble surface The molten chocolate mass is worked with a spatula until it begins to thicken (as it thickens it will be reaching the temperature range of 27 – 28c) This crystallised chocolate is added to the melted "untempered" chocolate and stirred in until the temperature of the mass is completely uniform. If the temperature is still too	Demonstrated in activity 3 OHT 12	e/resources-tempering methods/table method	e/resources-tempering methods/table method

high repeat the first two steps until temperature reaches 31-32c Stress that, if the correct temper is not achieved straight away, the process has to be repeated until satisfactory.			
Injection or addition method • This method involves adding shavings of chocolate are stirred into melted chocolate 45c • This helps cool the mass to 29-30c • Reheat the chocolate to the application temperature 31-32c	Demonstrated in activity 3 OHT 11	e/resources-tempering methods/injection method	e/resources-tempering methods/injection method
ACTIVITY 5 Demonstration Have Trainees watch you demonstrate the tempering of a batch of dark and one of milk couverture (using the injection method for one and the tabling method for the other. **Stress that Trainees test couverture for correct setting properties** **Activity 6 Demonstration** ***Molding and casting chocolate***	**Demonstration** **Equipment** Microwave x 4 set up in room Chocolate enrobe Glass bowls 1 per student Thermostat Marble slab x 4 (1 per bench) Rubber spoon 1 per student Silicon paper tests Paint scraper Pallet knife **Demonstration** Sea horses	**Demonstration** **Equipment** Same as face Hybrid Students will bring in chocolate tests for home work **Demonstration** Light pro-Conclusion L1 intro L2 Sea horses	
Conclusion of lesson	OHT 10	e/resource- what is tempering	e/resource- what is tempering

Of these two methods three factors are critical • Temperature • Time • Movement If one of these is missing it is impossible to temper the chocolate. The main propose of tempering chocolate is to obtain the smallest possible crystal to the desired characteristics in solidified chocolate such as setting properties, snap and sheen.		**Conclusion Hybrid** 500g chocolate with instructions go to www.blendedchocolate.com go to intro to working with chocolate. Follow the steps and bring in tests showing tempered chocolate	

Set up

Chocolate enrober @ 45c and melted

Packaged chocolate (500g) per student with instructions, small squares of silicon paper for tests

20kg of milk, dark and white callets

mini magnums

Ingredients: Cocoa bean, cocoa nibs, cocoa mass, cocoa butter, cocoa powder, milk powder, sugar, vanilla bean, compound, couverture

Sea horse moulds

Microwave x 4 set up in room

Chocolate enrobe

Glass bowls 1 per student

Thermostat

Marble slab x 4 (1 per bench)

Rubber spoon 1 per student

Silicon paper tests

Paint scraper

Pallet knife

Library

Check computers are booked

Light pro set up in class room

What you should achieve

element	**performance criteria**
On completion of this unit your Trainee should be able to: **Element 3** Handle moulds	You will know they have achieved this when they can: (tick when completed) ❑ Ensure that moulds to be used are clean, polished, and free of dust or residue. ❑ Keep moulds constantly at the correct temperature when being used and ensure that they are untouched by bare fingers. ❑ Ensure that the polished surface is never touched by objects which may dull, scratch or damage it.

Lesson 2 activities

1. Temper chocolate (Demo face)	Page: 5
2. Moulding and casting chocolate (Demo face)	Page: 8
3. Chocolate faults	Page: 8 and 9

(add simplified outcomes)

Introduction to working with chocolate		Home work Check tests	
Moulding and casting chocolate			
About chocolate moulds			
Moulds can be made from stainless steel, tinplate or various types of plastic, and vary in their flexibility and resistance to shock. All moulds have to be handled with great care and should only be polished with non abrasive soft materials. A soft cotton based cloth or quality cotton wool are best. For chocolates to be easily removed from a mould and to retain a high gloss, it is essential to thoroughly clean and polish each mould. When applying good work practices, moulds very rarely need to be washed. They can simply be cleaned after every use with a plastic scraper. Never clean with a knife or metal object, as this may cause damage.	Show chocolate molds Cotton wool Polish moulds	Show chocolate molds Cotton wool Polish moulds	
Equipment needed • moulds for chocolates (pralines) ladle • Temper the melted chocolate • Flat scraper **For the filling:** • Ganache, praline or filling of choice • piping bag with plain tip • small palette knife **Optional:** Plastic gloves or a good quality brush with medium hard bristles	White board	e/resources	

Activity 1 **Revise activity 5 lesson 1** **Temper chocolate** The purpose of tempering chocolate is to pre-crystallise the cocoa butter in the chocolate, which is related to the working temperature of the chocolate. During tempering, the cocoa butter in the chocolate changes into a stable crystalline form. It ensures the hardness, shrinking force and gloss of the finished product after it has cooled. That is what we mean by tempering: bringing chocolate up to the right working temperature so that there are sufficient stable crystals. The 3 factors which are important during tempering are **time, temperature and movement**.	OHT 6 OHT 7 OHT 8 OHT 9 OHT 10	e/resources-what is tempering	e/resources-what is tempering
<u>Activity 1</u> **Using the injection/addition method temper chocolate** Pre-crystallisation is very easy if you add chocolate which has already been tempered to the melted chocolate. Callebaut Callets are useful for this. Callets have of course already been tempered. In other words, they are already in the required crystalline form, and can be added to the melted chocolate. The required quantity of Callets depends upon the temperature of the melted chocolate and the Callets. When the melted chocolate reaches a temperature of approximately 40 °C, you can add 15% to 20% Callets at ambient temperature (between 15 and 20 °C).	OHT 11	e/resources-tempering methods/injection method offer as a print out	e/resources-tempering methods/injection method offer as a print out
1. Melt the chocolate in a melting pan (set the thermostat to 45 °C).		e/resources-tempering thods/injection method Step 1	e/resources-tempering methods/injection method
2. Lower the thermostat (± 32 °C for dark chocolate / ± 30 °C for white		e/resources-tempering	e/resources-tempering

chocolate and milk chocolate) and immediately add 15% to 20% Callets at ambient temperature.		methods/injection method Step 2	methods/injection method
3. Stir the chocolate well to ensure the dispersion of the stable crystals of the Callets. Are the Callets melting too quickly? That is because the chocolate is still too hot. Add more Callets and continue stirring.		e/resources-tempering methods/injection method Step 3	e/resources-tempering methods/injection method
4. In this way, you will obtain a slightly thickened chocolate, which is ready to work with.		e/resources-tempering methods/injection method Step 4	e/resources-tempering methods/injection method
Activity 2 ***Moulding and casting chocolate*** *Ensure that the moulds are at room temperature and warm them lightly with a hot air blower (the ideal temperature of the moulds is 26° to 27°C). Avoid the moulds becoming warmer than the tempered chocolate.*		e/resources-applications/moulding/ casting/chocolates(pralines)	e/resources-applications/moulding/ casting/chocolates(pralines)
1&2. Pour the mould full of tempered chocolate. Hold the mould at an angle and, with the small palette knife, scrape the excess chocolate from the top and sides of the mould.		e/resources-applications/moulding/ casting/chocolates(pralines) step 1&2	e/resources-applications/moulding/ casting/chocolates(pralines)
3. Tap the mould firmly against the marble or worktable to remove any possible air bubbles from the chocolate.		e/resources-applications/moulding/ casting/chocolates(pralines) step 3	e/resources-applications/moulding/ casting/chocolates(pralines)
4. Pour the excess chocolate out of the mould ensuring that all the corners or sides of the mould are evenly covered with chocolate.		e/resources-applications/moulding/ casting/chocolates(pralines) step 4	e/resources-applications/moulding/ casting/chocolates(pralines)
5. Remove the remains of the chocolate from the top and sides of the mould with the small palette knife.		e/resources-applications/moulding/ casting/chocolates(pralines) step 5	e/resources-applications/moulding/ casting/chocolates(pralines)
6. Let the chocolate set for about 5 minutes: put the mould on a paper sheet (open side down) and allow the excess chocolate to drip onto the paper (until the dripping chocolate begins to set).		e/resources-applications/moulding/ casting/chocolates(pralines) step 6	e/resources-applications/moulding/ casting/chocolates(pralines)

7. Scrape the last remains of chocolate off the mould and leave the mould to harden for a few minutes in the refrigerator (10°C). The moulds are then ready to fill with a ganache or other filling.		e/resources-applications/moulding/ casting/chocolates(pralines) step 7	e/resources-applications/moulding/ casting/chocolates(pralines)
8. Fill the moulds with a ganache, a praline or any filling you wish. You should use the piping bag with a plain tip (or no tip at all). Fill to within 2mm of the edge. Otherwise it becomes impossible to close the mould. Make sure the filling is not too warm (max 25°C). Once filled, let the filling set.		e/resources-applications/moulding/ casting/chocolates(pralines) step 8	e/resources-applications/moulding/ casting/chocolates(pralines)
9. Close the pralines: warm the top of the mould very briefly with the hot air gun. Then apply a small quantity of tempered chocolate with the small palette knife and spread it over the top. Do this a little at a time rather than putting too much chocolate into the mould at once.		e/resources-applications/moulding/ casting/chocolates(pralines) step 9	e/resources-applications/moulding/ casting/chocolates(pralines)
10. Smooth over the top and scrape away any excess chocolate from the top and edges. Now place for ±30 minutes in the refrigerator (10°C).		e/resources-applications/moulding/ casting/chocolates(pralines) step 10	e/resources-applications/moulding/ casting/chocolates(pralines)
11. First tap lightly with the back of the palette knife against the mould. Then release the chocolates gently from the mould onto a sheet of paper on a stainless steel plate.		e/resources-applications/moulding/ casting/chocolates(pralines) step 10, 11, 12	e/resources-applications/moulding/ casting/chocolates(pralines)
Chocolate faults When couverture has been melted and allowed to solidify without tempering it lacks gloss and hardness. **Fat Bloom** Fat bloom appears as a light brown to greyish coating or streakiness on the surface of the chocolate. It is greasy to touch and easily rubbed off. Upon magnification, minute fat crystals are visible. bad tempering of chocolate resulting in inadequate pre-crystallisation insufficient melting - chocolate did not reach a high enough temperature to completely dissolve all fat crystals incorrect cooling - too low or too rapid the addition of fats incompatible with cocoa butter storage area temperatures are too	**Faults/Fat Bloom** **White board** Some causes of fat bloom include:	**Faults/Fat Bloom** e/resources-fat bloom	**Faults/Fat Bloom** e/resources-fat bloom

high or fluctuating too much Emphasize fat bloom is more noticeable on dark chocolate than on milk chocolate. **Sugar Bloom** Sugar bloom also appears as a light brown to greyish coating on the surface of chocolate. Unlike fat bloom, it isn't greasy to touch and it is not removed by touch. When magnified, minute sugar crystals are visible. Its crystalline appearance (frosting) is quite rough to touch and affects both, dark and milk chocolate. When moisture (condensation) settles on the surface, it will dissolve some sugar from the chocolate. Upon evaporation, this sugar crystallizes and remains on the surface. Rapid melting when touched humid storage conditions - above 75 per cent humidity deposit of 'dew' (condensation), mainly if cooled too quickly migration of moisture from centres, usually from fondant when it moulds, equipment or packaging are not completely dry storage in a damp cool area No contraction or shrinkage Sticking **Well tempered chocolate has** Crystallization of cocoa fats Gloss/sheen Colour Good snap/ hardness Good contraction	**Faults/Sugar Bloom**	**Faults/Sugar Bloom** e/resources-sugar bloom • Crystallisation of cocoa fats • Gloss/ sheen • Colour • Good snap/ hardness • Good contraction	**Faults/Sugar Bloom** e/resources-sugar bloom • Crystallisation of cocoa fats • Gloss/sheen • Colour • Good snap/ hardness • Good contraction

Tip: Wear gloves to avoid leaving finger marks on the molded chocolates. Ideally, place the mould on a cleaned surface to avoid attracting dust or chocolate crumbs. The pralines and moulds are always electrostatically charged for a short time and easily attract unwanted dust and crumbs.

Set up

Chocolate enrober @ 45c and melted full

40kg of milk, dark and white callets

Sea horse moulds

Microwave x 4 set up in room

Chocolate enrobe

Plastic bowls 1 per student

Thermostat

Marble slab x 4 (1 per bench)

Rubber spoon 1 per student

Silicon paper tests

Paint scraper

Pallet knife

Hair dryers

gloves

Library

Check computers are booked

Light pro set up in class room

What you should achieve

element	performance criteria
On completion of this unit your Trainee should be able to:	You will know they have achieved this when they can: (tick when completed)
Element 4 Make moulded chocolates	❑ Select couverture or coatings appropriate to the filling and use. ❑ Temper couverture correctly and set in moulds ensuring it is of even and correct thickness and free from marks or air bubbles. ❑ Apply a range of fillings ensuring a level surface and allowing sufficient space for sealing with a layer of chocolate of appropriate thickness. ❑ Handle and store de-moulded chocolates so they retain their glossy surface.
Element 5 Coat chocolate confectionery	❑ Temper and manipulate couverture to the correct viscosity. ❑ Bring items to be coated to the correct temperature. ❑ Coat prepared centres using techniques ensuring an even and correct thickness of chocolate and a uniform quality finish. ❑ Execute hand-dipping in a logical and accurate manner. ❑ Decorate and present chocolate confectionery attractively.
Element 6 Store chocolates and chocolate Confectionery	❑ Store chocolate and chocolate confectionery at the correct temperature and level of humidity. ❑ Protect chocolate and chocolate confectionery from light and incompatible odours and store them in a dry place.

Lesson 3 prepare chocolates and chocolate confectionery Resources

Activity 1 **Moulding and casting chocolate** Ensure that the moulds are at room temperature and warm them lightly with a hot air blower (the ideal temperature of the moulds is 26° to 27°C). Avoid the moulds becoming warmer than the tempered chocolate.	
1. Pour the mould full of tempered chocolate. Hold the mould at an angle and, with the small palette knife, scrape the excess chocolate from the top and sides of the mould. 1 2	http://www.ecallebaut.com/html/default.dhtml Pics 1 & 2
2. Tap the mould firmly against the marble or worktable to remove any possible air bubbles from the chocolate. 3	http://www.ecallebaut.com/html/default.dhtml Pic 3
3. Pour the excess chocolate out of the mould ensuring that all the corners or sides of the mould are evenly covered with chocolate. 4	http://www.ecallebaut.com/html/default.dhtml Pic 4
4. Remove the remains of the chocolate from the top and sides of the mould with the small palette knife. 5	http://www.ecallebaut.com/html/default.dhtml Pic 5
5. Let the chocolate set for about 5 minutes: put the mould on a paper sheet (open side down) and allow the excess chocolate to drip onto the paper (until the dripping chocolate begins to set). 6	http://www.ecallebaut.com/html/default.dhtml Pic 6
6. Scrape the last remains of chocolate off the mould and leave the mould to harden for a few minutes in the refrigerator (10°C). The moulds are then ready to fill with a ganache or other filling. 7	http://www.ecallebaut.com/html/default.dhtml Pic 7
7. Fill the moulds with a ganache, a praline or any filling you wish. You should use the piping bag with a plain tip (or no tip at all). Fill to within 2mm of the edge. Otherwise it becomes impossible to close the mould. Make sure the filling is not too warm (max 25°C). Once filled, let the filling set. 8	http://www.ecallebaut.com/html/default.dhtml Pic 8
8. Close the pralines: warm the top of the mould very briefly with the hot air gun. Then apply a small quantity of tempered chocolate with the small palette knife and spread it over the top. Do this a little at a time rather than putting too much chocolate into the mould at once. 9	http://www.ecallebaut.com/html/default.dhtml Pic 9
9. Smooth over the top and scrape away any excess chocolate from the top and edges. Now place for ±30 minutes in the refrigerator (10°C).	
10. First tap lightly with the back of the palette knife against the mould . Then release the chocolates gently from the mould onto a sheet of paper on a stainless steel plate. 10 11 12	http://www.ecallebaut.com/html/default.dhtml Pics 10, 11, 12

Tip: Wear gloves to avoid leaving fingermarks on the molded chocolates. Ideally, place the mould on a cleaned surface to avoid attracting dust or chocolate crumbs. The pralines and moulds are always electrostatically charged for a short time and easily attract unwanted dust and crumbs.

Self Check

Did you understand the activity/activities you were asked to do?

Did you allocate enough time to complete the activity/activities?

Can you prepare chocolate moulds for lining?

Can you line moulds with tempered couverture?

Do you understand the reason for maintaining temperature and viscosity in the couverture you use?

Can you prepare the fillings correctly?

Do you feel confident enough to attempt a more difficult recipe for preparing fillings?

Do you understand why the fillings have to be level and 2 mm away from the rim?

Do you feel you can confidently prepare a range of moulded chocolates?

Do you understand why special storage conditions for chocolates are required?

If you have answered NO to any of the above questions, ask your Trainer for help.

If you feel you do not fully understand an activity, repeat it.

APPENDIX 4

Fair Answer sheet

Class: **Name:**

Multiple choices

1. What sort of fruit does a cocoa bean come from?

Chocolate fruit

Cocoa bean

Cocoa pod

Cocoa flower

2. Who are the 3 biggest producers of cocoa beans?

Columbia, Ecuador, Cameroon

Ivory Coast, Ghana, Indonesia

Ghana, Papua New Guinea, Dominican Republic

Indonesia, Brazil, Mexico

3. The first process of the raw cocoa beans is

Drying

Storage

Fermentation

Roasting

4. Cocoa mass is made from

Cocoa butter

Cocoa nibs

Cocoa liquor

Cocoa powder

5. What is tempering

When you are angry at the chocolate

Heating chocolate to 45°c then cooling it to 31°c

Melting and setting chocolate

Fermenting the cocoa beans to remove the pulp from the beans

6. The ingredients for dark couverture are

Cocoa mass, cocoa butter, milk powder, sugar

Cocoa mass, cocoa butter, sugar, cream

Cocoa butter, milk powder, sugar

True and false

1. Cocoa beans are firstly graded for quality before export

True / False

2. Cocoa beans are air freighted to Europe as ingredient for chocolate making

True / **False**

3. Cocoa butter is the natural oil from coconuts

True / **False**

4. Cocoa cake is made by extracting cocoa butter from cocoa mass

True / False

5. Conching is a process of chocolate making

True / False

6. Table and addition are two methods of tempering chocolate

True / False

7. Cocoa butter is the ingredient that controls whether couverture chocolate is liquid or solid state

True / False

8. Couverture chocolate has a minimum of 32% of cocoa butter

True / False

9. There are three points that are critical to successfully crystallizing chocolate; Time, Movement and Temperature

True / False

10. You can temper chocolate using a microwave and marble slab

True / False

For more information contact:

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