



Final report

Feedbase Adoption Plan eLearning Project

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Abstract

The eLearning project has delivered an interactive educational portal for the extension of Meat and Livestock Australia research project outputs. Participants can be guided with scaffolded learning, to effectively increase their comprehension, knowledge, and practical understanding of MLA research projects. The portal can be used to maximise adoption and execution of these learnings on farm, resulting in productive best practice across the industry. The outcome has been achieved by implementing systems that allow engaging content to be created and differentiated according to the learning needs of users. Analytics of user engagement with training packages and other content is collected to provide the basis of review and continuous improvement of the system.

Executive summary

Background

The aim of the eLearning project is to increase uptake and knowledge derived from MLA research project outputs. This project will create an online learning module that enhances the existing education and training resources by providing a method to 'activate' static education products, such as final reports, technical papers and large training manuals into an interactive eLearning tool to underpin the existing array of MLA user guides, technical documents and training products. In addition, the product will provide MLA capacity to review de-identified site analytics to improve its extension programs.

Objectives

The core objectives of the project were:

- Delivery of an eLearning education model that enhances producers understanding gradually, using the information of MLA research projects outputs,
- A method to capture user login details and preferences for their future use and improved MLA reporting,
- A method that increases producers understanding, knowledge and implementation of MLA RDE&A across all levels of the market,
- Ability to activate external content into the modules via linking MLA tools and calculators,
- A feedback loop to allow continuous improvement of the system over time, Enhanced engagement information through the analysis of learner analytics.

Methodology

The project implemented a methodology that was to:

- Create or modify an existing MLA system to capture user information to better tailor information, tools and communications to them.
- Capture active participation, location, participation initial understanding and progressively checks for comprehension throughout the program.
- Collect and report end user for monitoring and evaluation of the uptake of research, and gaps in the extension and training matrix.
- Provide evidence that PGS learning outcomes are understood.

Results/key findings

The elearning.mla.com.au website and system has been implemented and is able to achieve the core objectives. User uptake has been limited as MLA have expressed a desire for additional eModules to be added before its official launch. It is linked to the etools.mla.com.au tools and calculators. Morgan Rural Tech has undertaken to provide hosting support for an additional 12 months under the existing contract to align with the support requirements for etools.mla.com.au.

Benefits to industry

The eLearning ecosystem delivered in the project provides a comprehensive source of interactive learning and assessment tools available to the red meat industry in Australia. The structured content

delivery caters to producers of all knowledge levels in a way that has not been previously provided. Finally, the ability to monitor user engagement and extract analytics affords valuable insight into industry trends and behaviours that were inaccessible beforehand.

Future research and recommendations

It is recommended to include training providers in the delivery of training packages where appropriate to increase user engagement, participation, understanding and implementation of research and development. It is suggested that this be achieved using a flipped or blended learning approach.

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1. Background

The 2013-17 Feedbase Investment Plan (FIP) research teams developed comprehensive series of peer reviewed R&D reports outlining best practice management to address feed quality and quantity. These research outputs are currently static and do not engage all learning types within our industry. This project was initiated to pilot a method to 'activate' static education products, such as final reports, technical papers and large training manuals into an interactive eLearning tool to underpin the existing array of MLA user guides, technical documents and training products (MLA 2018).

In September 2018, a Terms of Reference (TOR) was distributed to multiple service providers and a call for tenders was initiated. The TOR detailed the background behind the intended project, a description of desired objectives and methodologies.

Tenders called for a project that aimed to create an online learning system that enhances the existing education and training resources supporting Profitable Grazing Systems (PGS) and other MLA extension programs. In addition, the product will provide MLA capacity to review de-identified site analytics to improve its extension programs.

On the 21st of November 2018 MLA advised Morgan Rural Tech Pty Ltd that their tender had been successful to deliver on the objectives of the project. The project was contracted and started in May 2019.

2. Objectives

Within the terms of reference, the contracted consultant was to provide:

- Delivery of an eLearning education model that enhances producers understanding gradually, using the information of MLA research projects outputs,
- A method to capture user login details and preferences for their future use and improved MLA reporting,
- A method that increases producers understanding, knowledge and implementation of MLA RDE&A across all levels of the market,
- Ability to activate external content into the modules via linking MLA tools and calculators,
- A feedback loop to allow continuous improvement of the system over time,
- Enhanced engagement information through the analysis of learner analytics.

3. Methodology

3.1 Project methodology

3.1.1 Stage one

- Meet with MLA and key stakeholders to develop a clear set of actions to improve the outcomes of this investment and establish an individual workplan for each tool.
- Provide MLA with a draft plan for the total of works required and timeframes to complete.
- Develop a prototype of each tool for comment and approval by MLA, key stakeholders and tools and calculator developers within the project objectives.

- Note: Prototype examples may be presented in a variety of means, though they must be interactive in a manner that the producer groups can easily understand and provide feedback.
- Work with the MLA project manager and FAP team to organise testing with a suitable range of end-users and address feedback as required and agreed.

3.1.2 Stage two

- Develop the final version of the tools and calculators, and MLA database interface.
- Test with prototype participants, MLA stakeholders and tool and calculator developers.
- Consolidate any final changes and activate online.
- Provide the methodology for ongoing maintenance.

3.2 Stakeholder Engagement and Prototyping

Morgan Rural Tech met with stakeholders in Melbourne and Sydney during stage one to assess the MLA project outputs and developed a work plan for the implementation of the project. This included how content is related and other IT requirements such as the need for integration with the myMLA login. Prototypes were demonstrated at the meeting in Sydney as well as possible graphic designs and layouts.

To enable the final version of the website and systems Morgan Rural Tech implemented the following:

Server Provisioning and Hosting

- Provision a stand-alone server in a Sydney data centre for exclusive hosting of the elearning.mla.com.au and etools.mla.com.au websites
- Liaise with MLA to add Domain Name System (DNS) A records that point to the provisioned servers.
- Install Plesk hosting platform to allow a graphical user interface to manage the websites.
- Install custom firewall and geo-blocking software on the server to enhance security and reduce target area for attacks.
- Design and implement a backup and recovery strategy for the websites.
- Implement caching solution for site performance.
- Add a staging website for initial testing and a production website for code, content and functionality to be migrated to once complete.

Content Management System (CMS) and Learning Management System (LMS)

- Build a website utilising an open-source Content Management System (CMS) and add a Learning Management System (LMS) that can capture users learning.
- Create a content model that allowed training packages to be categorised into different stages of user learning. User's learning can be scaffolded by providing worked examples in tools linked to the content as well as providing support in workshops.
- Liaise with MLA and modify the website to integrate the myMLA login so that existing MLA users can use the site without creating new credentials.
- Add custom code and functionality to the CMS so that geographical zones can be created to allocate training packages to them.
- Add custom code to allow users to define location(s) relevant to them.

- Add geographical zones to training packages using the LMS.
- Filter content based on user's locations.
- Capture users PIC Registration and Flock Code# for further use in the profile section.
- Install Elementor content editor within Wordpress to allow users with little training to create and style content and training packages.
- Implement site analytics to understand how users are interacting with the content and associated tools to provide a feedback to assess which research & development is being engaged with and which needs further refinement for user interaction.
- Provide a custom page for access to the individual tools located at etools.mla.com.au.
- Provide custom reporting pages to export assessment and user data into excel for analysis.
- Activate online at the request of MLA.

Pilot eModule creation from MLA project outputs

- Morgan Rural Tech to add new content into the pilot system including soil testing, visual indicators of soil condition and Feedbase information across different learning areas of the content model.
- Create custom library page that displays training packages filtered and sorted by the categories introductory, intermediate, and advanced.
- Implement a custom theme and graphic design requested by MLA.

Provision of training and methodology for ongoing maintenance

- Provide training to MLA staff on the creation of new content, training packages and quizzes, including how to assign training packages to a zone and content level (i.e., Introductory).
- Provide hosting over the life of the project.

4. Results

4.1 eLearning Education Model and System

The eLearning educational model was designed to be relevant, engaging, visually appealing, scaffolded with supports such as tools and media and allow users to progress in their learning. To deliver on the task requirement "Create or modify an existing MLA system to capture user information to better tailor information, tools and communications to them" (MLA 2018), Morgan Rural Tech implemented a Content Management System (CMS) and Learning Management System (LMS) that meets these requirements and objectives.

The eLearning model is made up of training packages built from outputs of MLA research project outputs (Fig. 1). They integrate user assessments (quizzes) to provide feedback to users on their learning progression and integrate tools and interactive content for further learning and engagement.

Figure 1 Training package introduction page

The screenshot shows the 'Soil testing' training package introduction page on the mla website. The page features a header with the mla logo and navigation links: Library, Tools & calculators, Events, and Information & FAQs. A search icon and 'Sign in' link are also present. The main content area has a background image of a field with a person taking a soil sample. The title 'Soil testing' is prominently displayed, with the subtitle 'HEALTHY SOILS & PASTURES, INTRODUCTION'. Below the title, there is a 'View Training package details' link and a 'Start Training package' button. A 'TRAINING PACKAGE INCLUDES' section lists '4 Items' and '4 Quizzes'. The 'Overview' section explains that soil testing is a management tool for measuring soil fertility and conditions, and that incorrect techniques can lead to misleading results. The 'Learning objectives' section states that producers will be able to understand when and how to best take a soil test and confidently choose sampling sites in a paddock.

HEALTHY SOILS & PASTURES, INTRODUCTION

Soil testing

View Training package details

Meat & Livestock Australia April 7, 2020

Start Training package

Open Registration

TRAINING PACKAGE INCLUDES

- 4 Items
- 4 Quizzes

Overview

Soil testing is a management tool that gives a measure of soil fertility and conditions. Incorrect soil sampling techniques can produce misleading results. Sub-optimal soil conditions can reduce dry matter production, impacting livestock production. Soils tests allow you to identify what may be limiting production and invest in appropriate inputs.

Learning objectives

At the completion of this module, producers will be able to:

- understand when and how to best take a soil test
- confidently choose sampling sites in a paddock

Users engage with the content and can see their progression through the training package. Throughout the training package topics, quizzes can be created to test users understanding (Fig. 2).

Figure 2 Training package in progress

The screenshot displays the 'Soil testing' training package interface. On the left, a sidebar shows the course progress: 'Soil testing' (9% Complete, 2/4 Steps). The main content area is titled 'Taking a soil test' (ITEM 2 OF 4) and is marked as 'In Progress'. It includes a sub-section 'How do I know when to take a soil test?' with text explaining the best time to test (when there is some soil moisture) and a note that soil testing should be done once a year. Below this is another sub-section 'What tools do I need?' with text explaining that soil sampling involves taking cores of a consistent size and depth, and that specially designed soil samplers are preferable to a shovel. An image of a person using a soil sampler is visible on the right.

Engagement with the eLearning system can come from multiple entry points; however, most users will come to the home page (Fig. 3) to start their learning progression.

Figure 3 Home page of the eLearning system

The screenshot shows the home page of the eLearning system, titled 'The toolbox'. The page features a navigation menu at the top with 'Library', 'Tools & calculators', 'Events', and 'Information & FAQs'. The main content area is organized into a grid of six categories, each with an icon and a list of sub-items:

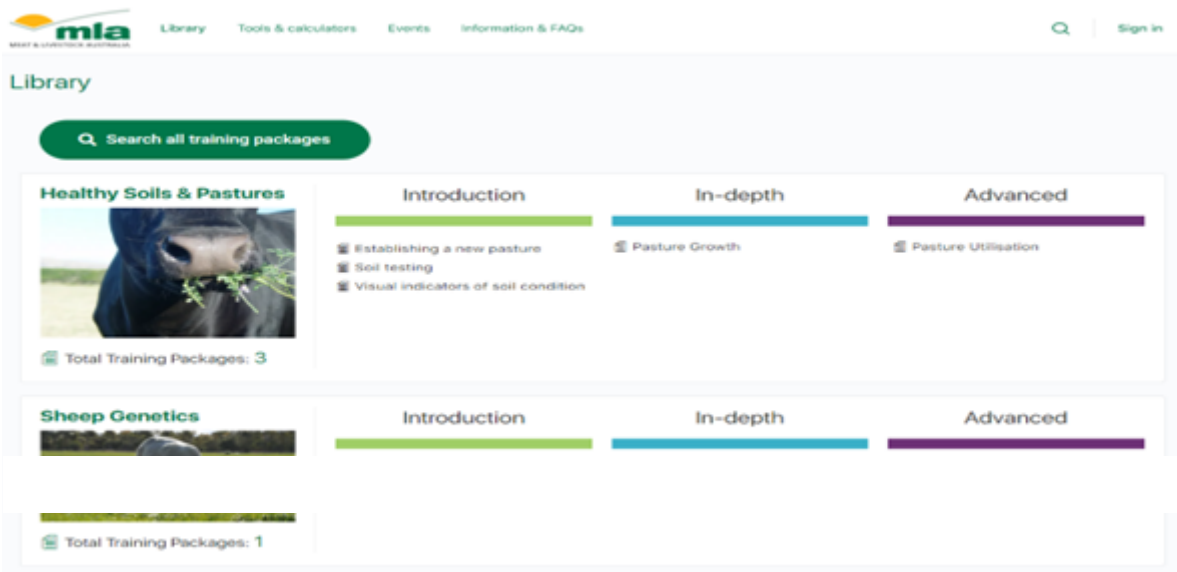
- Get started** (Icon: Home): Courses, Lessons, Quizzes
- Take a tour** (Icon: Airplane): Planning, Budgeting, Projections
- FAQs** (Icon: Question mark)
- Library** (Icon: Book)
- Tools & calculators** (Icon: Calculator)
- Events** (Icon: Calendar): Workshops, Webinars, Conferences

Training packages can be filtered and categorised (Fig. 4) to be relevant and at the users current learning progression. The first level is the introduction to the main points of the topic with the key

benefits or “hook” to increase engagement and uptake. The second level takes a guided learning approach where content is scaffolded, allowing the user to attempt examples of implementation and develop competency. The third level is focused on advanced learning and involves access to all detailed information, tools, and training.

Within the Content Management System (CMS), the library page was custom built to display training packages in the three levels. Administrators can assign a training package a level in the Learning Management System (LMS) and it will be displayed as shown in figure 4.

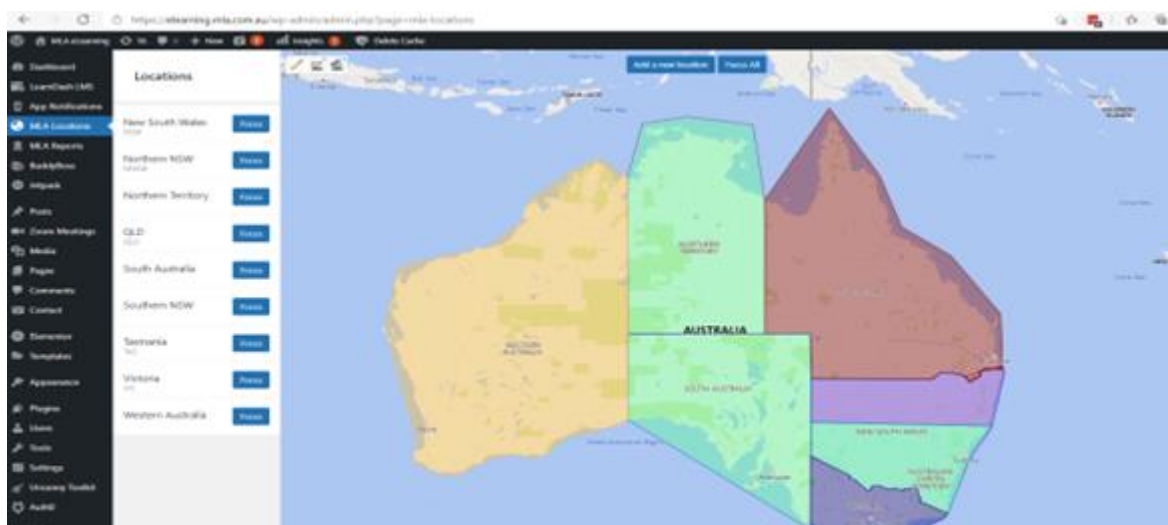
Figure 4 Training package content levels



The screenshot shows the MIA Library interface. At the top, there is a navigation bar with 'Library', 'Tools & calculators', 'Events', and 'Information & FAQs'. A search bar is present with the text 'Search all training packages'. Below this, two main sections are visible: 'Healthy Soils & Pastures' and 'Sheep Genetics'. Each section has a header image and a 'Total Training Packages' count. Underneath each section, there are three columns representing content levels: 'Introduction', 'In-depth', and 'Advanced'. The 'Healthy Soils & Pastures' section shows 3 packages, with 'Introduction' containing 'Establishing a new pasture', 'Soil testing', and 'Visual indicators of soil condition'; 'In-depth' containing 'Pasture Growth'; and 'Advanced' containing 'Pasture Utilisation'. The 'Sheep Genetics' section shows 1 package, with 'Introduction', 'In-depth', and 'Advanced' levels listed but no specific content items shown.

To further categorise content by geographical locations, Administrators can create zones which are then related to training packages. This interface (Fig 5) was custom interface built within the CMS to map these geographical zones.

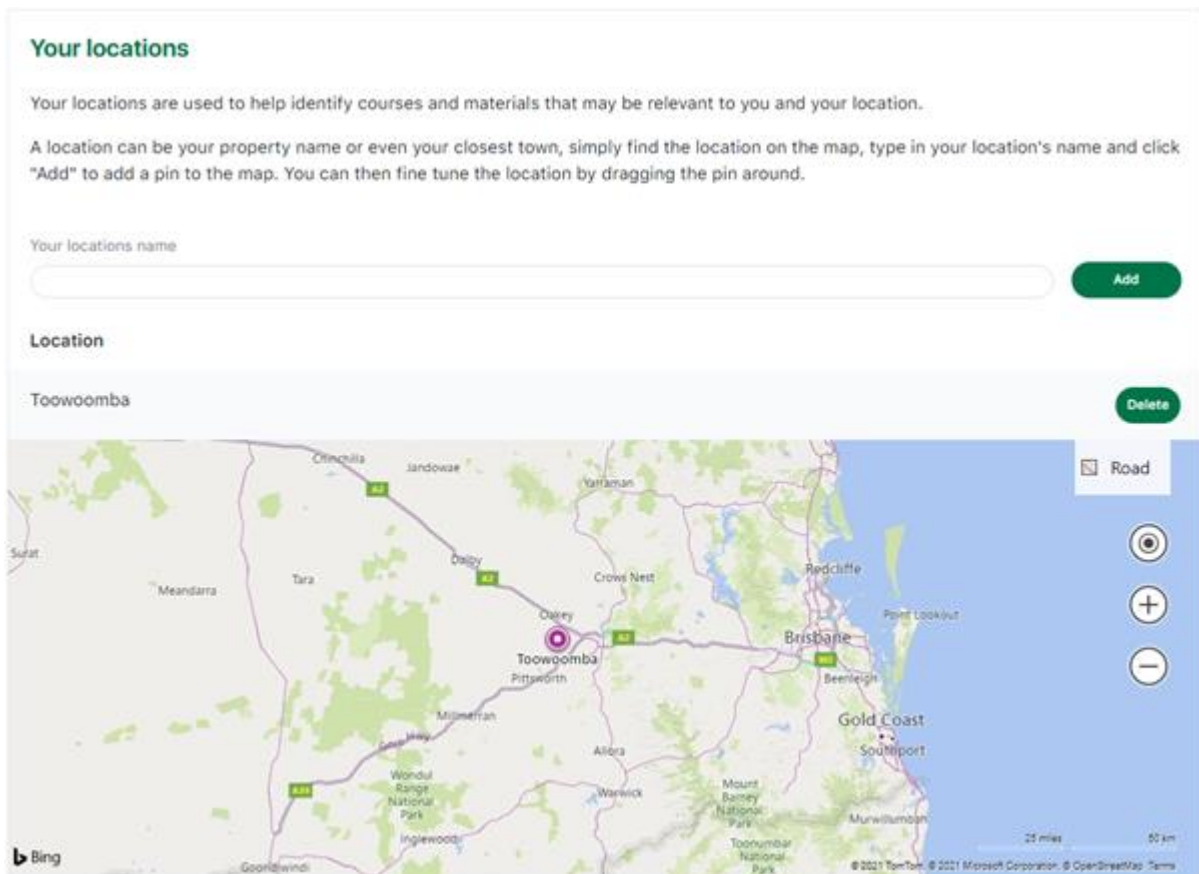
Figure 5 Setting Geographical Zones



The screenshot shows the MIA Learning Admin interface for setting geographical zones. On the left, there is a sidebar menu with various options like 'Dashboard', 'Learn/Exam LMS', 'App Notifications', 'MIA Locations', 'MIA Reports', 'Book/Bookings', 'Inquiry', 'Pages', 'Zoom Meetings', 'Media', 'Pages', 'Comments', 'Contact', 'Timeline', 'Templates', 'Appearance', 'Pages', 'Items', 'Tools', 'Settings', 'Missing Tools', and 'Audit'. The main area displays a map of Australia with several colored zones overlaid. A 'Locations' panel on the left lists the following zones with 'Yes/No' buttons: New South Wales, Northern NSW, Northern Territory, QLD, South Australia, Southern NSW, Tasmania, Victoria, and Western Australia. The map shows these zones as distinct colored areas across the Australian continent.

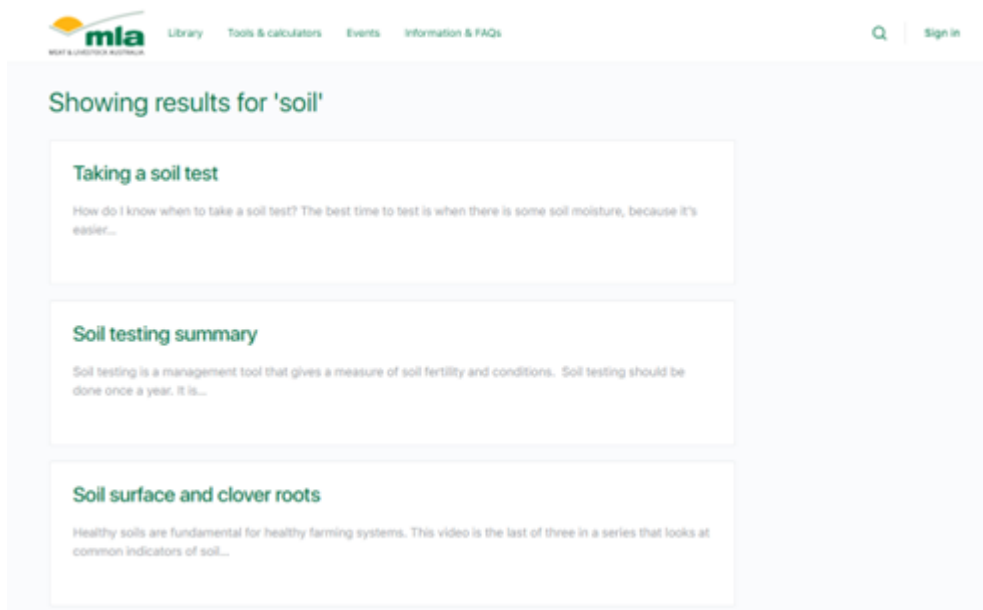
Finally, users can select one or more locations (Fig. 6) relevant to them and the training packages can be filtered to provide region specific content and materials. For example, if a training package was set for Southern NSW and a user had a location that intersected that mapped region, then the view can be filtered to only show training packages related to that area.

Figure 6 User location functionality



Users can search for addition content to further enhance their understanding of MLA research project outputs by using the search function within the CMS. Fig. 7 shows the output from a search on soil from within the system.

Figure 7 Search functionality of the CMS



4.2 Assessing user progression and system performance

Reports on user's progress and interaction with the system provides us with evidence to support if the eLearning education model implemented is enhancing producer understanding gradually using the information of MLA research project outputs. An example of a report that provides this evidence is shown in Fig. 8

Figure 8 User report with percentage completion

User ID	User	Progress	Completed On
99	Quinn quinn@mla.com.au	65%	
71	grain grain@mla.com.au	6%	
100	jenelle jenelle@mla.com.au	47%	
102	johnson@mla.com.au johnson@mla.com.au	65%	
51	spencer@mla.com.au spencer@mla.com.au	24%	

Administrators can further drill down into a User's profile to assess completion and correct responses as in Fig. 9.

Figure 9 Detailed analysis of user results

You have taken the following quizzes:

- [Test your knowledge: Breeding objective traits - 100% Statistics \(edit\) \(remove\)](#)
Score 2 out of 2 question(s) . Points: 2/2 on March 19, 2021 4:33 pm
- [Test your knowledge: Breeding objective traits - 50% Statistics \(edit\) \(remove\)](#)
Score 1 out of 2 question(s) . Points: 1/2 on March 19, 2021 4:32 pm
- [Test your knowledge: Breeding objective traits - 50% Statistics \(edit\) \(remove\)](#)
Score 1 out of 2 question(s) . Points: 1/2 on March 19, 2021 4:30 pm
- [Test your knowledge: Breeding objective traits - 50% Statistics \(edit\) \(remove\)](#)
Score 1 out of 2 question(s) . Points: 1/2 on March 19, 2021 4:29 pm
- [Test your knowledge: Breeding objective traits - 50% Statistics \(edit\) \(remove\)](#)
Score 1 out of 2 question(s) . Points: 1/2 on March 19, 2021 4:26 pm
- [Test your knowledge: Breeding objective traits - 0% Statistics \(edit\) \(remove\)](#)
Score 0 out of 2 question(s) . Points: 0/2 on March 19, 2021 4:24 pm
- [Test your knowledge: Choosing the right index - 100% Statistics \(edit\) \(remove\)](#)
Score 3 out of 3 question(s) . Points: 3/3 on March 19, 2021 4:22 pm
- [Test your knowledge: Choosing the right index - 66.67% Statistics \(edit\) \(remove\)](#)
Score 2 out of 3 question(s) . Points: 2/3 on March 19, 2021 4:22 pm

Administrators are also able to export all user assessments / quizzes (Fig. 10) and analyse in tools such as Excel.

Figure 10 Export functionality and output of user assessments / quizzes

The screenshot shows the 'MLA Reports' section of an eLearning administration interface. A 'User Quizzes' button is highlighted, with a tooltip that says 'Export all users and their quizzes (users not supported, includes non-logged in users)'. Below this is a table with columns for user email, user display name, quiz title, question text, correct answer, incorrect answer, score, and date. The table contains multiple rows of data representing individual quiz attempts by various users.

In addition, site analytics provide evidence to support engagement of the website in general. This combined with training package analytics provide by the LMS provide good feedback to assess what changes need to be made across the site. Fig. 11 provides an example of the site analytics showing what sections have been viewed.

Figure 11 Site view by month and views by training *package*

The eLearning system provides linkages to external content by providing a dedicated page for access to the tools and by linking directly in the training packages relevant to the external content. For example, Fig. 12 shows the dedicated Tools and Calculator page with Fig. 13 showing links to external content.

Figure 12 Dedicated Tools and Calculator Page

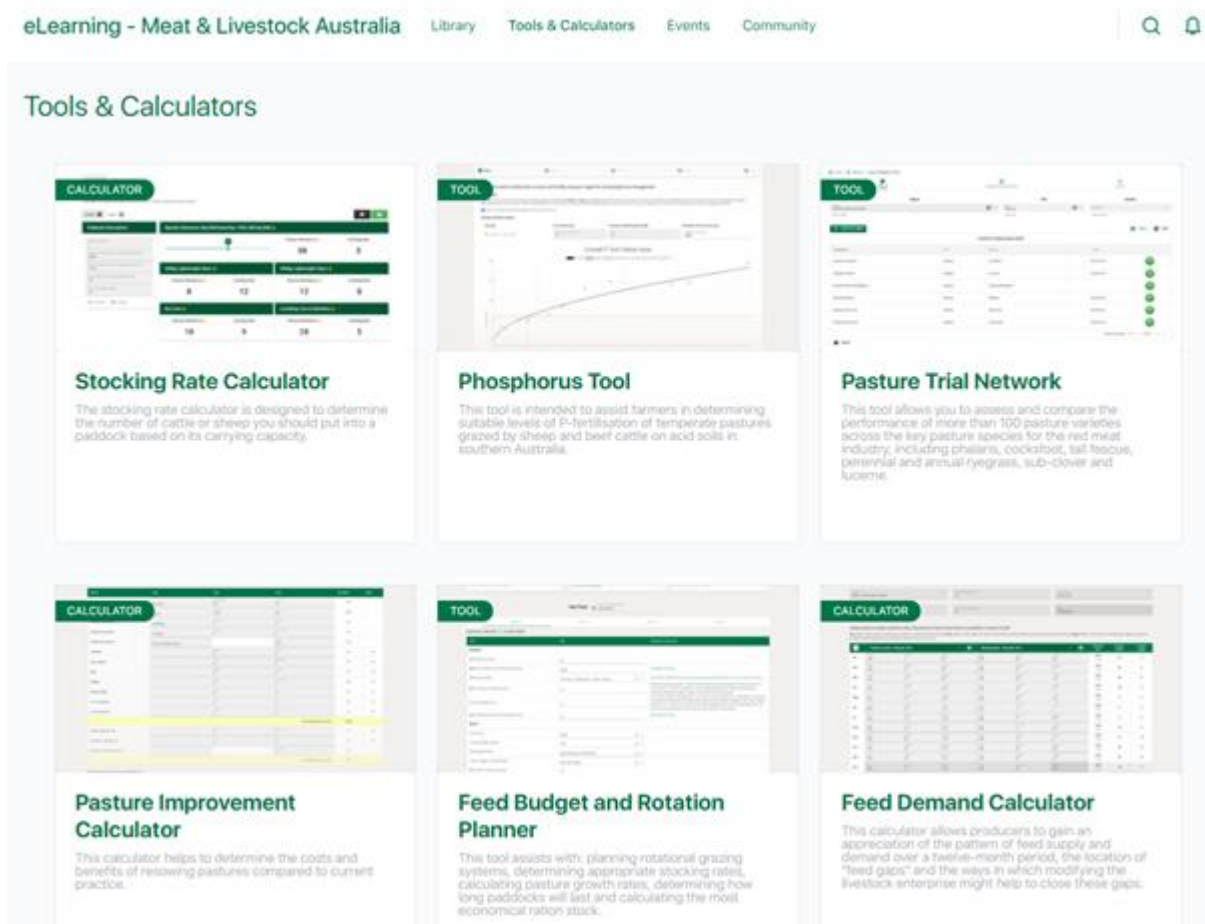
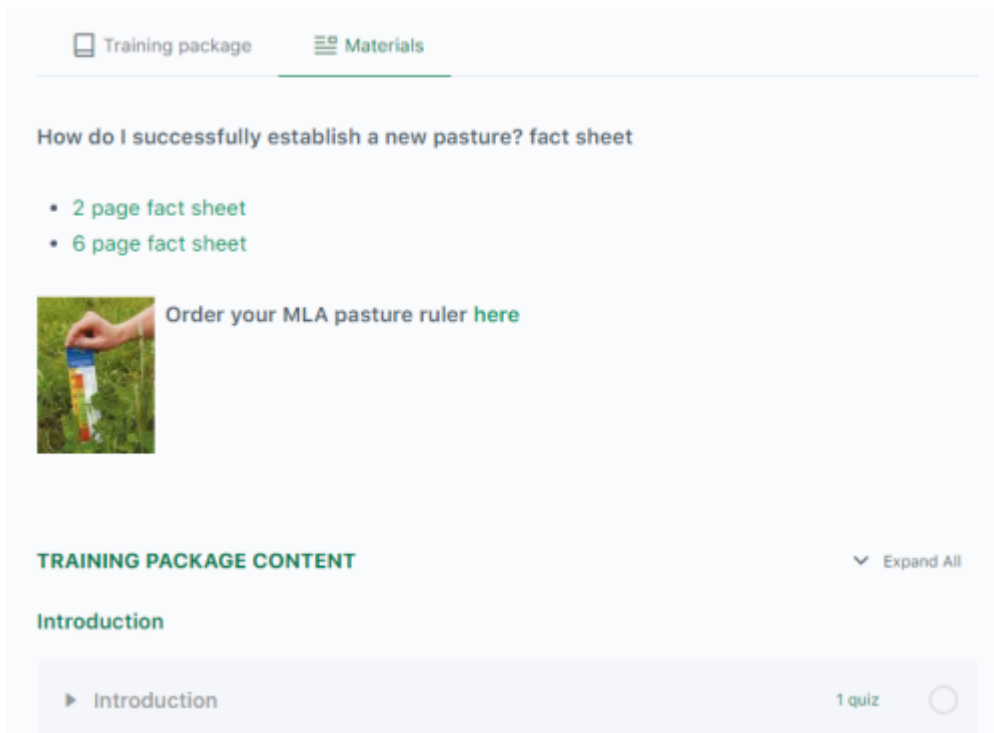


Figure 13 Training packages that link to external resources



4.3 MyMLA login and Extended User Profiles

The elearning.mla.com.au has been integrated with myMLA authentication. This means that users that register on the MLA website and have a myMLA login can use the same credentials to sign-in to the eLearning site. Fig. 14 shows the authorisation screen users see when attempting to sign-in to the system.

Figure 14 User authentication using their myMLA login



The screenshot displays the myMLA login interface. At the top center is the myMLA logo, which includes the text 'my mla' and 'MYST & LIFETILES PLATFORM' below it. Below the logo, the text 'Welcome to myMLA' is centered. The login form consists of two input fields: 'Email address' with the value 'aproducer@producedowns.com.au' and 'Password' with masked characters. To the right of the password field are icons for a dropdown menu and a toggle to show/hide the password. Below the password field is a blue link for 'Forgot password?'. A large green button labeled 'Continue' is centered below the form. At the bottom of the page, there is a link for 'Don't have an account? Sign up'.

The system has been modified to capture additional information such as a user's PIC registration and Flock Code enabling analysis of engagement with training packages and learning outcomes (Fig. 15).

Figure 15 Extended profile information to capture preferences, details for improved MLA reporting

The screenshot shows the 'Edit "Details" Information' form. The form is titled 'Edit "Details" Information' and is located on the 'mla' website. The form includes the following fields:

- First Name (required):** A text input field containing the letter 'A'. Below the field is a 'Public' status indicator and a 'Change' link.
- Last Name (required):** A text input field containing the word 'Producer'. Below the field is a 'Public' status indicator and a 'Change' link.
- Nickname (required):** A text input field containing 'A Producer'. Below the field is a 'Public' status indicator and a 'Change' link.
- Where are you located?** A text input field containing 'Dubbo'. Below the field is a 'Public' status indicator and a 'Change' link.
- PIC Registration:** An empty text input field. Below the field is a 'Public' status indicator and a 'Change' link.
- Flock Code#:** A text input field with a placeholder text: 'Enter in your Flock Code. If you have multiple codes, please separate them by a comma ","'. Below the field is a 'Public' status indicator and a 'Change' link.

The form is part of a larger interface with a navigation menu at the top (Library, Tools & calculators, Events, Information & FAQs) and a search bar. On the left side, there are options for 'Profile photo' and 'Cover photo'.

5. Conclusion

The project has delivered the agreed objectives using an interactive educational portal and will continue to provide a training pathway for the extension of MLA project outputs. Participants are guided with scaffolded learning, to effectively increase their comprehension, knowledge, and practical understanding of MLA research projects. The portal provides an avenue for adoption and execution of these learnings on farm, resulting in productive best practice across the industry.

5.1 Key findings

The elearning.mla.com.au website and system has been implemented and is able to achieve the core objectives. User uptake has been limited as MLA have expressed a desire for additional eModules to be added before its official launch. It is linked to the etools.mla.com.au tools and calculators. Morgan Rural Tech has undertaken to provide hosting support for an additional 12 months under the existing contract to align with the support requirements for etools.mla.com.au.

5.2 Benefits to industry

The elearning.mla.com.au website uses a Content Management System (CMS) and Learning Management System (LMS) and will continue to provide a process for the extension of MLA project outputs in the future. Its functionality allows for integration with different modes of delivery such as flipped, online or blended learning. The sites analytics and reports allow for assessment of the delivery model to implement continuous improvement to the system.

6. Future research and recommendations

Online delivery alone in a self-paced environment suits some learners, but for many, they require interaction with peers or training providers. It is recommended that MLA investigate the use of this portal with a flipped or blended learning model. For the flipped learning model, producers could interact with content prior to a workshop allowing them to have some prior learning. Then at the workshops, learning objectives could be achieved with further scaffolding if required or more advanced concepts could be introduced and grasped. Additionally, the blended learning model (where producers and training providers interact over tele or video conferencing) allows live interaction. Where internet speeds allow, video conferencing would allow screen sharing and interaction with other producers helping with engagement and learning outcomes.

7. References

Meat & Livestock Australia Limited (MLA) (2018). Terms of Reference – Feedbase e-Learning modules Sep 2018.doc