HSC Agriculture

Assessment Task 3, 2023

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| **TOPIC**: Research Assessment – Farming for the 21st Century | **MARKS:** / 40 |
| **SUBMISSION REQUIREMENTS:** **Week 2 Term 2**  All components to be submitted **ONLINE** through **CANVAS** by **Thursday 11th May 2023** | **WEIGHTING:**  25% |
| **OUTCOMES TO BE ASSESSED:**  H3.4 **Evaluates** the management of the processes in agricultural systems  H4.1 **Justifies** and **applies** appropriate experimental techniques, technologies, research methods and data presentation and analysis in relation to agricultural problems and situations  H5.1 **Evaluates** the impact of innovation, ethics and current issues on Australian agricultural systems | |
| **DIRECTIONAL VERBS:**  **Apply -** Use, utilise, employ in a particular situation  **Evaluate -** Make a judgement based on criteria; determine the value of  **Justify -** Support an argument or conclusion | |
| **TASK DESCRIPTION:**  **Part A:**  Students are to provide an **evaluation** of a range of technologies that are assisting in the advancement of agricultural production systems.  *“Evaluate a range of new technological developments that may assist agricultural industries*”  **Part B:**  Students are to review and **evaluate** the Journal Article provided by completing the supplied questions in relation to current research methods of technological developments in agriculture and present the information as a written report. | |
| **ASSESSMENT CRITERIA:**  **Part A Evaluating Technology H5.1**  Students are to **evaluate** three (3) of the five (5) broad categories of technologies.   * + Satellite technologies   + Computer technologies   + Biotechnologies   + Electronic identification systems   + Robotics   Students are to use the ALARM to assist them in formulating a response to “*Evaluate a range of new technological developments that may assist agricultural industries*”. Responses need to be approximately 2-3 paragraphs on each technology.  **Part B Journal Analysis H3.4 H4.1**  Students are to **evaluate** the supplied Journal Article on the “**Wireless sensor networks to study, monitor and manage cattle in grazing systems**” specifically the methodology, collection of data, presentation of the data, analysis of data, conclusions and recommendations.  Students are to use the Journal Article to complete the following questions.   1. Outline the aims of this research study 2. What may have led to this study being undertaken? 3. Describe the research methodology, including treatments, control, replication, standardisation and randomisation. 4. Identify the data collected in this Journal Article? 5. How was this data collected? 6. Examine the methods used to present data in the Journal Article? 7. Evaluate the data’s effectiveness in conveying the results? 8. Justify the conclusions that were made from the research? 9. Assess the direct or potential value do these research findings provide to farmers? 10. Identify further research might arise from this project? 11. Outline any ethical issues that may be involved in this research.   Students are provided with a scaffold to assist in the preparation of a written report to be submitted. This is NOT to be submitted as your final report. | |

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| **Assessment Criteria** | | |
| **Part A: Evaluating Technology H5.1** | **Mark** | **Grade** |
| A comprehensive **evaluation** will demonstrate an extensive understanding of the chosen technology that demonstrates a **judgement** based on the validity of the three (3) technologies within an agricultural setting. A logical **explanation** of at least two (2) positive AND negative aspects of using each technology in agriculture. An extensive **description** of the key features of each technology as applied within an agricultural setting. | 18-20 | A |
| A thorough **evaluation** will demonstrate an extensive understanding of the chosen technology that demonstrates an **explanation** of the validity of the three (3) technologies within an agricultural setting with some inconsistencies. A logical and less detailed **explanation** of at least two (2) positive AND negative aspects of using the technology in agriculture. A thorough **description** of the key features of the technology as applied within an agricultural setting although some details may be lacking. | 14-17 | B |
| A sound **evaluation** will demonstrate a sound understanding of the chosen technology that demonstrates a **description** of the validity of the three (3) technologies within an agricultural setting with some inconsistencies OR an **explanation** of the validity of the two (2) technologies within an agricultural setting with some inconsistencies. A logical and detailed **description** of at least one (1) positive AND negative aspects of using the technology in agriculture. A **description** of the key features of the technology as applied within an agricultural setting although some details may be lacking. | 8-13 | C |
| A basic **evaluation** will demonstrate a basic understanding of the chosen technology that demonstrates an attempt to provide a **judgement** of the one or more technologies within an agricultural setting with inconsistencies. A **description** of one (1) positive AND/OR negative aspects of using the technology in agriculture. A **description** of a key feature of the technology as applied within an agricultural setting although some details may be lacking. | 3-7 | D |
| A limited **evaluation** will demonstrate a basic understanding of the chosen technology that demonstrates a relevant statement is provided that **outlines** a use for a technology within an agricultural setting. | 1-2 | E |

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| **Part B: Journal Analysis H3.4 H4.1** | **Mark** | **Grade** |
| Conducts a comprehensive review of a journal article that demonstrates an extensive **evaluation** on the wireless sensor networks to study, monitor and manage cattle in grazing systems. The **evaluation** includes the comprehensive understanding of the research methodology, data collection methods and the basic principles of experimental design have been **applied**. All data is extensively **evaluated** for its effectiveness and a **justification** is provided regarding the research conclusions. A comprehensive assessment is conducted on the impacts of the research on farmers including future projections and ethical concerns. | 18-20 | A |
| Conducts a thorough review of a journal article that demonstrates a thorough **evaluation** on the wireless sensor networks to study, monitor and manage cattle in grazing systems. The **evaluation** includes the thorough understanding of the research methodology, data collection methods and the basic principles of experimental design have been **applied,** although some details may be lacking. All data is **explained** for its effectiveness and an **explanation** is provided regarding the research conclusions with some inconsistencies. A thorough assessment is conducted on the impacts of the research on farmers including future projections and ethical concerns with some inconsistencies. | 14-17 | B |
| Conducts a sound review of a journal article that demonstrates a sound **evaluation** on the wireless sensor networks to study, monitor and manage cattle in grazing systems. The **evaluation** includes the sound understanding of the research methodology, data collection methods and the basic principles of experimental design have been **applied,** although some components may be incomplete or incorrect. The data may be **described** for its effectiveness and a **description** may be provided regarding the research conclusions with some inconsistencies. A **description** on the impacts of the research on farmers including future projections and ethical concerns with some inconsistencies. | 8-13 | C |
| Conducts a basic review of a journal article that demonstrates a basic **evaluation** on the wireless sensor networks to study, monitor and manage cattle in grazing systems. The **evaluation** may include a basic understanding of the components of a research paper and the conclusions drawn. A **description** on the impacts of the research on farmers and/or future projections and/or ethical concerns is attempted with some inconsistencies. | 3-6 | D |
| There is evidence of a limited review of a journal article that demonstrates a limited **evaluation** into cattle grazing systems. The aspects of research paper have been attempted but lack details in relation to relevance, correct format or conclusions drawn. | 1-2 | E |

**Part 1 – Evaluating Technology**

In your syllabus you are asked to “evaluate a range of new technological developments that may assist agricultural industries including:”

* + Satellite technologies
  + Computer technologies
  + Biotechnologies
  + Electronic identification systems
  + Robotics

For this task you will need to research and evaluate each of these. This should take no more than 1-2 paragraphs for each category of technology.

**PLEASE NOTE**: Evaluate means *“Make a judgement based on criteria; determine the value of”*

For each category (satellite technologies, computer technologies, biotechnologies, Electronic ID systems and robotics) you will be required to:

* Define (state the meaning)
* Identify an example of how it is used
* Describe (provide characteristics and features)
* Discuss (Identify issues and provide points for and/or against)
* Evaluate (Make a judgement based on criteria; determine the value of)

**Some resources you might find helpful can be found below:**

**Satellite technologies**, eg global imaging and global positioning systems

* <https://www.futurefarming.com/1045/eu-satellite-positioning-system-will-benefit-farmers/>
* <https://www.futurefarming.com/871/high-tech-satellite-bolsters-crop-monitoring/>
* <https://www.futurefarming.com/2042/variable-rate-technology-raises-farm-profitability/>
* <https://app.futurefarming.com/2017/06/30/leave-the-weeding-to-the-robots/content.html>

**Computer technologies,** eg climate/weather forecasting, laser technologies and computer record keeping systems

* <https://www.futurefarming.com/1436/smart-cameras-see-way-better-weed-control/>
* <https://app.futurefarming.com/2017/06/30/6-steps-to-manage-your-farm-data-successfully/content.html>
* <https://app.futurefarming.com/2017/06/30/leave-the-weeding-to-the-robots/content.html>
* <https://app.futurefarming.com/2017/06/30/slow-internet-speed-is-biggest-barrier-to-canadian-precision-uptake-says-survey/content.html>

**Biotechnologies**, eg genetically modified organisms

* <https://www.futurefarming.com/2262/gm-grass-risk-nz-farmings-competitive-advantage/>
* <http://www.abc.net.au/news/2017-07-07/bananas-boosted-with-vitamin-a-hoped-to-save-lives-in-africa/8660500>
* <https://www.facebook.com/abcnews.au/videos/10156947379454988/>
* <https://app.futurefarming.com/2017/06/30/gm-must-be-used-wisely/content.html>
* <https://app.futurefarming.com/2017/06/30/gm-corn-varieties-to-target-glyphosate-resistant-weeds/content.html>
* <https://app.futurefarming.com/2017/06/30/in-gmos-we-trust/content.html>

**Electronic identification systems**, eg NLIS

* <https://www.nlis.com.au/NLIS-Information/>
* <https://www.nlis.com.au/Faq/>
* <https://www.nlis.com.au/Glossary>
* <https://www.geekwire.com/2016/how-robots-are-taking-over-the-milking-parlor-and-why-its-good-for-the-cows/>
* <http://www.wiid.org/pdf/RFID-System-Applications-on-the-Farm-FINAL.pdf>

**Robotics**, eg milking, shearing and machinery

* <https://www.futurefarming.com/1583/first-commercial-robot-dino-weeds-up-to-5ha-of-veg-crops-a-day/>
* <https://www.futurefarming.com/868/world-first-farming-robots-project-makes-start/>
* <https://www.futurefarming.com/1436/smart-cameras-see-way-better-weed-control/>
* <http://www.dairyaustralia.com.au/Animal-management/Milking/Automatic-milking-systems.aspx>
* <http://www.abc.net.au/news/rural/2017-07-06/robotic-milked-cows-calmer-study-finds/8683400>

**HSC Agriculture**

**Outcome: H5.1 Evaluates the impact of innovation, ethics and current issues on Australian agricultural systems**

**Part A: Evaluate a range of new technological developments that may assist agricultural industries”**

Use the following ALARM to assist in the **evaluation** of three (3) technologies to answer the above question.

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| **Identify** | **Describe** | **Explain** | **Analyse** | **Evaluate** | |
| **Identify new technological developments in agriculture and an example of its use** | **Describe the features/components for each technology** | **What is the cause/effect of each technology** | **Provide points for and against using the technologies being used in agriculture** | **Make a judgement based on the criteria as to the validity of the technology within an agricultural setting** | |
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| **Critically Evaluate:** |  | | | |  |
| **Topic Concept:** | Evaluates the impact of innovation, ethics and current issues on Australian agricultural systems | | | |  |
| **Appreciate:** | Research is an important factor in the evolution and the promotion of agricultural advancement to enhance the productivity and effectiveness of agricultural production systems. | | | |  |

***Part A: Evaluating Technology:* “Evaluate a range of new technological developments that may assist agricultural industries”**

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**Logo

Description automatically generatedYear 12 Agriculture Assessment Task 3: Research Analysis**

**Part B**: Students are to use the Journal Article ““Wireless sensor networks to study, monitor and manage cattle in grazing systems” to complete the following questions.

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| **QUESTION** | **RESPONSE** |
| 1. Outline the aims of this research study |  |
| 1. What may have led to this study being undertaken? |  |
| 1. Describe the research methodology, including treatments, control, replication, standardisation and randomisation. | Methodology:  Control:  Replication:  Standardisation:  Randomisation: |
| 1. Identify the data collected in this Journal Article? |  |
| 1. How was this data collected? |  |
| 1. Examine the methods used to present data in the Journal Article? |  |
| 1. Evaluate the data’s effectiveness in conveying the results? |  |
| 1. Justify the conclusions that were made from the research? |  |
| 1. Assess the direct or potential value do these research findings provide to farmers? |  |
| 1. Identify further research might arise from this project? |  |
| 1. Outline any ethical issues that may be involved in this research |  |