Teaching With Sakai Innovation Award 2015
Course/Project Submission Form

1. Entrant Name(s) (last name/first name): TALLENTS / Lucy

2. Contact Info:

3. Affiliated Institution(s): University of Oxford

4. Course Name: "Conservation statistics"

5. Course or Project Award Category (select one):

___Traditional Higher Education (including web-enhanced courses)

_X_ Fully Online/Hybrid Courses

___K-12 (primary and secondary education)

___Project Sites & Alternative Uses of Sakai/Apereo OAE

6. Brief Summary or "Elevator Speech"

Wildlife conservationists in the developing world are the keepers of biodiversity, yet they lack access to training in research techniques to support their valuable work. By studying online they don't need to interrupt their work or pay the costs of overseas travel. This Sakai course is full of team activities and engaging learning materials. Students from around the world work together to learn how solutions developed on a different continent can help species in their local area. Feedback from their tutor and fellow students helps them to assess their attempts to save species, using scientific methods to improve their approach.

7. Description of Course or Project

 'Conservation statistics' is a 9-week postgraduate course taught entirely through Sakai. 20-25 wildlife conservation practitioners study part-time (10 hrs/week) to enhance their professional skills.

The course goals are to:
1. Encourage students to develop and refine their own conservation research.
2. Expose them to new techniques for visualising and analysing their field data using open-source software.
3. Encourage them to reflect on what they've learnt and apply their new skills.
4. Provide opportunities to collaborate across cultures, regions and professional backgrounds.

The learning outcomes are for students to:

1. Articulate their understanding and identify knowledge gaps.
2. Develop and critically evaluate research questions relevant to their own work.
3. Select and apply the appropriate statistical technique, and justify their choice.
4. Interpret their results and present visual, text and numeric evidence to support their conclusions.

My first online course was in Moodle, where I wrote the content but a tech team created the site. This is my second, and having more control means I can take advantage of Sakai's diverse toolset to present engaging, well-organised content, foster the development of a learning community, and encourage deep learning.

- I use **Lessons** to guide students through activities, prompting reflection through questions.
- Students articulate their learning in the **Forums**, explore ideas, share resources, and support and challenge their peers. Sakai allows them to view conversations in different ways, and keep track of new posts. Teams brainstorm and refine plans in private discussions before sharing them.
- Formative **Tests** provide immediate feedback on their understanding and application of techniques.
- Students benefit from public peer review and public/private tutor feedback through collaboratively-edited student pages (**Lessons**) and individual summative **Assignments**.
- **Markbook** collates marks from each student's team page and individual assignment, making it straight-forward to summarise and communicate their performance to them.
- **Surveys** collect feedback on the learning activities and tutor input, and promote reflection through a skills audit.
- **Chat** allows live troubleshooting of software code without requiring high bandwidth, and archives solutions for reference.
- The **Site info** tool is invaluable for me to monitor progress and offer assistance if someone hasn't accessed the course or a particular activity.
- **Announcements** introduce weekly topics and remind students about deadlines.
- With **WebDAV** I can easily upload updated resources.
- I write HTML pages offline, but it's quicker to embed multi-media content, link to resources and write equations in the **WYSIWYG** editor.

I aim to follow these pedagogical principles:

1. Learning as student-centred and problem-based, with multiple opportunities for reflection, discussion and application of skills.
2. Providing prompt feedback to affirm understanding and support efforts to correct errors.
3. Revisiting concepts and skills in a spiral curriculum.
4. Constructing knowledge together as students learn from each other and develop their own professional judgement.

I collaborate with Rajan Amin (ZSL) to create content. The Oxford University WebLearn team provide training and technical assistance on Sakai. In all other aspects, the creation and teaching of the course is my own work.

8. Self-Assessment

Criterion #1: Student Engagement and Community Building

A. Rating

___Not applicable

___Not evident

___Somewhat effective

___Effective

_X_ Excellent

B. Evidence to Support My Rating

Community-building and collaboration

Students introduce themselves on arrival and spontaneously cluster into friendly groups working on the same issue or species. They share previous experiences of learning statistics and reassure those who express anxiety.

Students have multiple opportunities to collaborate, ranging from standard practice to more innovative exercises:

1. Troubleshooting Forum for asynchronous problem-solving.
2. Chat room for synchronous diagnosis of code errors.
3. Data they generate together: the Google spreadsheet is embedded in a Lesson so tree leaf measurements can be entered within Sakai.
4. A collaboratively-edited mind-map hosted externally (on Mind42) to brainstorm conservation issues and organise them into themes.
5. Sakai allows diverse means of co-operating on the final assessment:
    a. Private discussions to develop ideas and divide work,
    b. Student pages in Lessons to create team reports,
    c. Comments and evaluation on student pages by self, peers and tutor (see Criterion 3 re reflection and 4 re feedback).

Students share their own interests and resources

In the 'What to research, and why?' forum they describe their research goals and refine them with peers and tutor. This is an active and popular forum with 56 messages in 12 conversations.

They can use their own data for the assignment, and joinable groups promote independence by allowing them to select team-mates without tutor involvement.

They can easily share resources in forums or on student pages, posting scientific papers (including their own publications), links to useful conservation guidance and equipment, their organisation's home page, TeD talks and local news articles.

C. Additional Supporting Evidence

Community-building and collaboration

Self-introductions and spontaneous clusters

Re: Tell us about yourselves...

Shu Woan   (29-10-2014 5:33 AM) - Read by: 9

Reply | Email | Mark | Edit | Delete Message

Hi Suprio,

Nice to meet you.

Were the whale and dolphin surveys also in Bangladesh? What species were you studying then?

Re: Tell us about yourselves...

Suprio   (29-10-2014 1:02 PM) - Read by: 9

Reply | Email | Mark | Edit | Delete Message

Hi Shu,

I volunteer for a River dolphin (*Platanista gangetica*) project for three years that gave me opportunity to participate first cetacean survey in the Bay of bengal in 2004. If you interested then please follow this link (http://archive.thedailystar.net/magazine/2008/10/01/wildlife.htm)

Cheers,

Suprio

Re: Tell us about yourselves...

Shu Woan   (05-11-2014 2:40 AM) - Read by: 8

Reply | Email | Mark | Edit | Delete Message

Thanks for the link! Were you working with Brian   at any point? How is the Irrawaddy dolphin population?

Re: Tell us about yourselves...

Gopal   (31-10-2014 12:18 PM) - Read by: 9

Reply | Email | Mark | Edit | Delete Message

Hi Suprio,

Pleased to know that you have worked with river dolphins. Did you work with the BCDP for the Ganges river dolphin research in Bangladesh ? Have you used occupancy modeling approach for dolphins there? I ran logistic regression models with my presence/absence data set (n= 65 segments, 1 Km long each) considering non-detection as an absence. I found negative relationship between probability of dolphin's presence and channel width, which i think is due to imperfect detection of dolphins. I would appreciate if you can share your some experience with these issues on river dolphin research.

Sharing resources and supporting each other in forums

Laura shares a resource:

Laura: "If anyone is trying to start getting to grips with R on a very basic level, I really recommend this course. It's free, and gives you the fundamentals really well. http://tryr.codeschool.com/levels/1/challenges/1"

Samuel: "I have no experience with any statistical programs, only ad-hoc learning through friends. Laura, I think I will check out that R course above too!"

Nathan: "Thanks, Laura for sharing the R link. As it is completely new to me, that link may indeed prove very useful - thank you."

Shannon supports Gail:

Gail: "My experience with statistics in university were pretty horrendous. [...] the lecturer read straight off his notes and wrote them all on several black boards, with very little explanation [...] Most of the students who actually bothered tried to write out everything he wrote, without understanding any of it. [...] I passed the course by memorising the notes [...] knowing that I was still clueless about stats!"

Shannon: "That's really a disappointing first introduction to statistics. I'm sorry you had to suffer through that. It looks like you have quite a bit of field-based experience...have you been able to do any self-teaching? Have you managed to use statistics in your professional life so far?"

Mid-course survey responses

Q: Is there anything else you'd like to tell us about the course overall?

A: *"Not too serious in it's delivery - excellent. The use of 'smileys' and casual language and content (e.g., the weather in the UK) make for a relaxed learning environment, and therefore a more cooperative one."*

Q: What was the most memorable or fun learning activity, and why?

A: *"Reading the self-introductions of the other students - it was a little overwhelming because of the number of students, but it was fascinating to read about where they come from and what they do."*

Q: What was the most useful leaning activity you engaged in, and why?

A: *"The Mind42(?) map of Pressure-State-Response-Benefit. I think this tool was great and helped to really visualise and categorise the broad subject of conservation in a single object. It was really great, actually. Perhaps my interaction and use of the tool was limited as the majority of links and items had already been added, in my view. Besides getting to it quicker, or setting a limit on how many contributions each participant makes within a day, I don't know how this could be changed in the future. Regardless, as I say, it was a fantastic visualisation tool."*

Group activity: View and edit the PSBR mindmap

Mindmaps are a way of visually structuring ideas about a topic, and can be useful to help you organise your thoughts and communicate them to your colleagues. You will be emailed an invitation to view the Pressure > State > Benefit > Response mindmap on the [Mind42](#) website, and you will need to create an account on this site to view the mindmap.

Browse through the mindmap section-by-section to see our suggestions for different:
- Types of **pressure** on biodiversity and ecosystem services,
- System **state**, from individual animals up to ecosystems,
- Ways in which people **benefit** from the system state,
- Management **response** to reduce pressure on the natural environment.

You also have the opportunity to edit the mindmap by adding your own ideas, alongside your coursemates. Can you think of conservation issues or actions which don't fall under the existing categories? Are there other facets of the natural system that you monitor and record in your field work? Without going into lots of detail, can you expand the mindmap so that it better reflects the complexity and variety of conservation issues that you've worked with?

Students share their own interests and resources

Mid-course survey responses

Q: What was the most useful leaning activity you engaged in, and why?

A: "The discussion on what to research and why is a good forum, as there are many students trying to answer similar questions, but in different ways and under different conditions."

A: "Developing research questions, and discussing each others' projects. I get to know different ideas for conservation 'problems' that I've never encountered."

A: "Course participants identifying hypotheses and predictions in their own situations. This was particularly useful as it clarified through the use of examples and critiques by peers and the tutor the difference between the two, and allowed the group to refine and understand what makes a good research question. This is of course following on from the great Sutherland article of the top 100 conservation questions - excellent idea to share this through the course."

The collaboratively edited mindmap
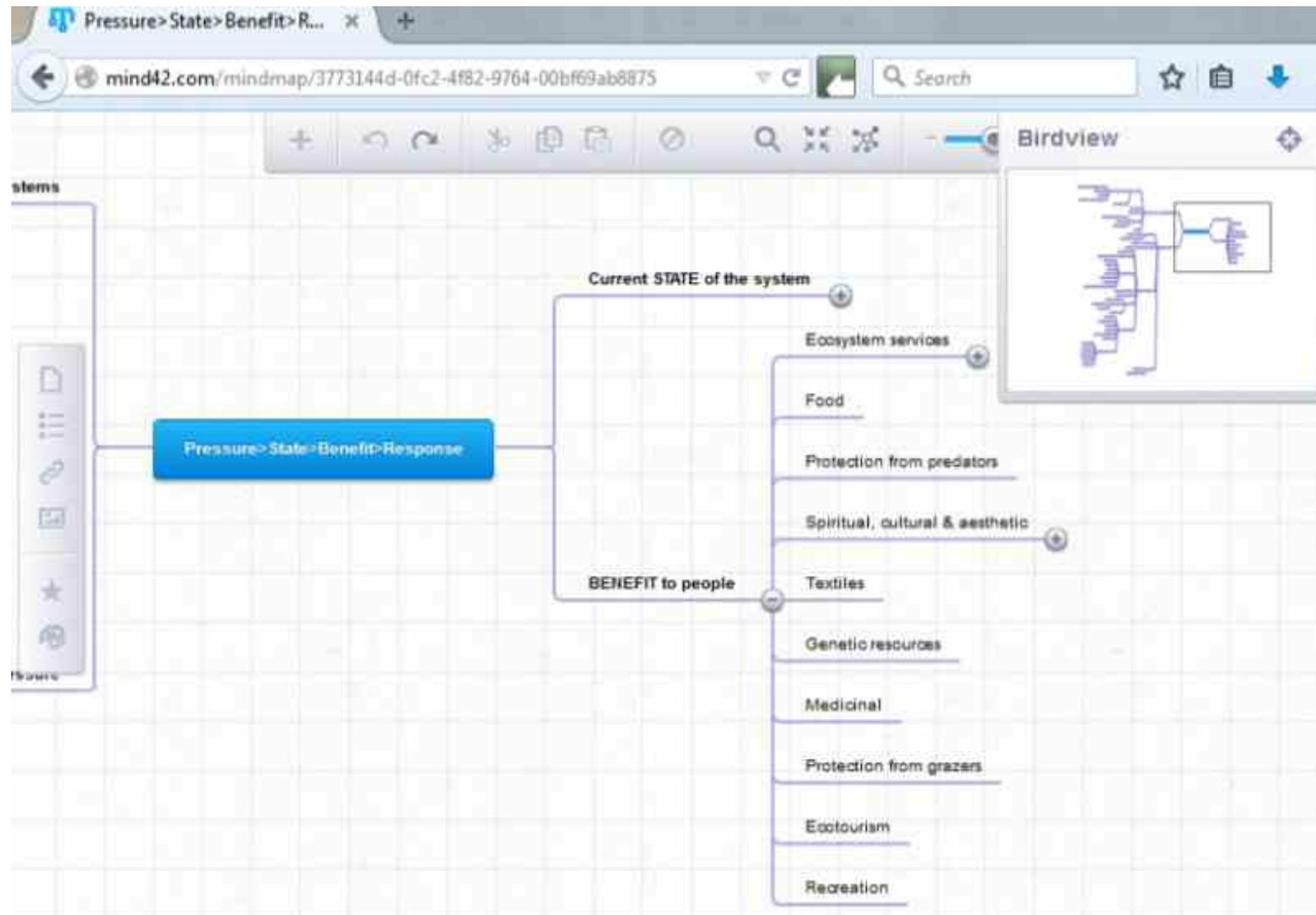
Criterion #2: Communication

A. Rating

___Not applicable

___Not evident

___Somewhat effective

___Effective

_X_ Excellent

B. Evidence to Support My Rating

Negotiating roles and expectations

an innovative orientation activity is designed to develop a consensus on students' responsibilities to self, tutor and peers, and my responsibilities to them. I've previously negotiated learning contracts face-to-face, and this is the first element of that process. On a student page edited by everyone, we unpack expectations about how we work and interact, and decide which behaviours create a supportive and exciting learning environment. This includes agreeing standards for the mode, quality and responsiveness of communications. Lessons pages are ideal because alongside wiki-style collaborative editing, the comments facility allows students to appraise and indicate agreement with our standards.

Multiple modes of communication

My students often live in remote areas with poor internet connections. To keep a level playing-field I deliberately avoid synchronous video or audio, so those who can't stream them don't feel excluded.

Even without these, Sakai provides diverse ways to communicate:

- One-way: learning materials as HTML, pdfs and videos; announcements; feedback in Tests (see Criterion 4); minute papers (questions on Lessons pages); tutor feedback on individual assignments (I plan to use audio recordings for this in the future); student self-evaluation on team pages.
- Two-way: Forums, chat, polls (questions on Lessons pages), peer and tutor comments on team pages.

It's easy to embed audio recordings in Sakai discussions. In the future I will introduce myself in this way as well as through text, and encourage everyone to do likewise so that we can hear each other's voices.

C. Additional Supporting Evidence

Negotiating roles and expectations

Orientation, including consensus-building on roles & standards

Orientation and self-introductions

Before you dive into the main topic of conservation research, please go through the orientation information and activities listed here. These activities will help you to acquaint yourself with the online platform, the kind of learning activities you will do, and your fellow coursemates! Even if you have studied online courses before, it always takes some time to familiarise yourself with a new virtual learning environment. These introductory activities are designed to help you become comfortable and confident with WebLearn.

- **M0-0 - PG Cert introduction: Home page**
  Home page for the orientation activities
- **M0-1 - Introduction to the PG Cert**
  Introduction to the overall postgraduate certificate in conservation research techniques, of which this is the first module
- **M0-2 - Activities on the course**
  A description of the different learning activities you will engage in during the course, from discussions and computer-based exercises to individual reflection and group work
- **M0-3 - Self-introductions**
  Now that you understand more about the online learning environment, let's try out one of its best features - the discussion forum!
- **Self-introductions**
  Use this forum to tell the group about yourself, and learn about your fellow students
- **M0-4 - Agreeing roles and expectations**
  Instructions for working towards a group consensus on our roles within this course, and expectations of ourselves and each other

Student Pages

Roles and expectations (Everyone)

:k   **Next**

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Our roles & standards: Explore and build a consensus

Before we begin our work together, let's take some time to consider our roles and responsibilities during the course. You will all have expectations of yourself as learners, your tutor and your fellow learners or peers. You may rarely have voiced these expectations in the past but it can be really useful to share them, to better understand how everyone views their role within this community.

In this activity, we aim to reach a consensus on guidelines for our roles and interactions on this course. We will collaborate to write a brief description of our respective roles as learners, tutor and peers, and negotiate shared standards for our communications.

This may be the first time you've ever taken part in negotiation about roles and standards. It's your opportunity to consider how you can promote a good learning environment for yourself and others, and set realistic goals for how you work together with your peers and tutor. Don't be shy about voicing your ideas and commenting on others'; everyone's opinion is relevant and valid.

Consider these questions to help you frame your ideas:

1. What expectations do you have of yourself as a learner, and what responsibilities do you have to yourself?
2. What expectations do you have of the people learning beside you; your peers? What responsibilities do you have to your peers, and they to you?
3. What expectations do you have of your tutor? What responsibilities do you have to your tutor, and they to you?
4. What principles should underlie our work together?
5. What standards should we set for our interactions?
6. What words might describe our interactions with each other, relating to either the style (etiquette) or content (information) of our communications?

You might want to bear these points in mind:

- We'll engage in a many different types of interactions, including discussion forums, immediate chat, collaborative group-work, emails, giving and receiving feedback from peers and tutor, in both public and private forums.
- We can communicate in audio or video formats as well as written.
- We come from a wide range of cultural, ethnic and professional backgrounds.
- We're based in many different time-zones, and people may devote themselves to this study at varying times of the week, which may affect their responsiveness.

You've already experienced the discussion forums as one way to work together. Now we're going to use another feature of this learning environment; a shared page (wiki), for building a group resource. Continue to the shared page and write your ideas in response to the questions and prompts above. Try to keep your ideas succinct so our document doesn't reach an unmanageable size! A single descriptive word may be enough to convey standards, or a short sentence for expectations or responsibilities. If someone else has summarised your idea already, don't repeat it but feel free to edit what they have written.

Multiple modes of communication

<u>Student engagement with each other in the forums</u>

All students replied to my invitation to introduce themselves, two-thirds initiated at least one conversation, and 80% posted in at least one of the forums created by other students. Within individual forums, 50-55% of students engaged in a given forum.

<u>Guidance on starting their own conversations</u>

Discussion: Evidence-based conservation

Go to the discussion forum entitled 'Conservation as a scientific discipline' and share your response to the paper and some of your reflections with your coursemates. If you're the first person to arrive at this forum topic, you're welcome to get things going by clicking the 'Start a New Conversation' button on the top-left and calling it 'Evidence-based conservation'. If a conversation on this topic already exists, please post a reply to it rather than creating your own new conversation (it's not much of a conversation if everyone's talking to themselves!). Respond to posts by at least two other people, by commenting on similarities or differences in your reaction, asking for clarification, or proposing how evidence-based conservation might be applied in their situation.

Criterion #3: Learning Materials and Strategies

A. Rating

___Not applicable

___Not evident

___Somewhat effective

___Effective

_X_ Excellent

B. Evidence to Support My Rating

Active learning

Hands-on practice is integral, and well-supported by Sakai. After studying theory, students download pdf instructions from Lessons, check understanding in Tests and solve problems in Forums/Chat. Adapting code to analyse their personal data gives them outputs of immediate use in their job, whilst building confidence to develop their skills independently.

Students enjoy working with the collated dataset. By contributing their own data and analysing everyone's, they identify flaws in the process and experience first-hand how to improve it.

Navigation & visual design

In the weekly Lessons students can see at a glance what activities await, and visually track their progress. They use Next/Back buttons to navigate materials, whilst access to Forums is maintained through the tools menu to encourage on-going conversations.

In Sakai it's easy to embed materials in multiple formats, including Xerte modules, external videos, powerpoint and interactive decision-making tools. These diversify the expert voice and allow dynamic sharing of ideas.

Reflection

Reflection is incorporated from the orientation to the final assessment. Students prepare for Forums in guided reflections and complete minute papers after a Lesson. Using a Survey for the skills audit means students can view anonymised results, revealing where they lie on the spectrum of experience and emphasising how they can learn from, and teach, their peers. Finally, ten percent of their marks are based on a reflection submitted with the Assignments tool.

I could enhance my implementation of reflective activities if Sakai allowed sharing of text answers to Lessons questions, as it does for numeric responses.

C. Additional Supporting Evidence

Active learning

<u>Mid-course survey responses</u>

Eight-seven percent of 15 respondents agreed (9) or strongly agreed (4) with the statement that '*The course contains a good balance of independent study and reflection, group discussions and practical exercises*', while 13% disagreed (2).

Seventy-three percent agreed (8) or strongly agreed (3) that '*Discussions increased my understanding of the topic*', while 27% disagreed (4).

Q: What was the most memorable or fun learning activity, and why?

   A: *"Creating a collaborative dataset. Because it makes me understand the data better and interested in processing them. And we also make careless mistakes, which makes it a better chance than a given ready data to do the error correction."*

   A: *"The most memorable is the collecting of LeafData on my own and being independent to input it. "*

   A: *"creating a data sheet with other students and analyzing it and compare answers with students in the forum."*

Q: What was the most useful leaning activity you engaged in, and why?

   A: *"So far, importing and organizing a real data set in R. Independant use of R will be most useful thing I take away from the course."*

   A: *"Going through cleaning survey data by myself and interacting with other students for practice exercises because those activities were very practical and learned different way to approach to develop R syntax"*

Navigation & visual design

<u>Mid-course survey responses</u>

Q: Is there anything else you'd like to tell us about the learning activities and materials?

   A: *"I think they were very manageable in terms of splitting the week's activities and exercises across multiple .pdfs allowed participants to find natural breaks in work, and made it more "digestible". Also, by being able to download the guides, they will be usable in the future and, therefore useful to refer back to if required. "*

One week's learning activities, as organised and displayed in the Lessons tool

M1-3-04a Importing data into R
Let's get that leaf dataset into R!

E1-3-05_RealLifeDataInR.pdf
Learn how to import data from a spreadsheet to create your own data.frame object in R

M1-3-04b Deal with data-entry errors in R
Take a look at our leaf morphology data and see if you can spot any data-entry errors that need fixing

Working with data in R
What data-entry errors have you found in our leaf data?

E1-3-06_CorrectErrors.pdf
Using R's data manipulation functions to correct data entry errors

M1-3-04c Measurement scales in R
How does R determine what measurement scales are used by each variable in your data.frame?

Working with data in R
Consider with your coursemates what measurement scale is used for each leaf morphology variable

E1-3-07_MeasurementScales.pdf
Learn how to specify the measurement scale of each variable in your R data.frame

E1-3-08_GettingHelpInR.pdf
Find out how to access R's inbuilt help facility

E1-3-09_WorkWithColumns.pdf
Export and import Rdata objects, append new data, and change the sort order of rows

ExtraData.RData
Leaf morphology data from previous students, to combine with you and your coursemates' dataset.
See the instructions in the activity 'Work with columns in R'.

M1-3-04d Missing data or null values
Correctly define missing data in your R objects

E1-3-10_MissingData.pdf
Learn how to deal with missing data in R

Troubleshooting
Use the Troubleshooting forum to request help and offer advice on diagnosing R problems

Test: First steps in R
Check and practice your newly-learned skills by taking the 'First steps in R' test

Reflection

Instructions for reflection on the final assessment, submitted and marked with the Assignments tool

Were you pleased with your work on this assignment? What have you learned from doing it, and how can you apply these lessons to your own conservation research? Would you approach this task in a different way in the future? If so, how, and why?

What problems did you encounter when trying to develop and answer your research question? These could include technical (coding), conceptual (understanding and interpreting the statistical tests) or inter-personal (collaborating online), or other types of difficulties. How do you think you could solve them if you had to do the same task again?

Skills audit as a Survey so anonymized results can be shared with the group

week-by-week

Chat Room

Announcements

Schedule

Forums

Tests

Assignments

Surveys

Site Members

Search

Site Stats

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Markbook

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I am confident I know and can do this well

I think I know and will try, but may make mistakes

I used to know but can't remember any more

I've heard of this but don't know how to do it

I don't even understand the question!

Confidence in skills

* 1. Describe the difference between categorical and continuous data
* 2. Describe the difference between nominal and ordinal data
* 3. Describe R vector, data.frame and list objects
* 4. Import data from text/Excel files into R
* 5. Locate and correct data-entry errors using R
* 6. Deal with missing data in R, (e.g. using is.na)
* 7. Use square brackets '[ ]' to select subsets of data in R
* 8. Calculate descriptive statistics in R
* 9. Create tables to summarize data in R
* 10. Create simple graphs: histogram, scatter plot, bar & box plot
* 11. Adjust the colour, symbols, and axes on plots in R
* 12. Run a general/generalised linear model in R
* 13. Interpret the results of a linear model
* 14. Annotate and store my R code for future use

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Criterion #4: Learning Outcomes and Assessment

A. Rating

___Not applicable

___Not evident

___Somewhat effective

___Effective

_X_ Excellent

B. Evidence to Support My Rating

Learning objectives & alignment

Learning objectives are clearly stated for individual topics. Learning materials, activities, formative and summative assessments are aligned with the learning objectives to encourage deep learning. When learning how to run statistical tests, for example to achieve the learning objective 'Create and interpret a table of dAIC values and model weights', students read the background statistical theory and are guided through the relevant software code. They are required in their team assignment to apply the code to their own data or the collaboratively-created dataset, and justify their conclusions based on their interpretation of the statistical results.

Feedback

Formative Tests include hints and feedback to explain why answers are right or wrong, and emphasise the value of a particular concept or technique. I also use Xerte to structure some learning activities because it allows feedback on individual multi-choice answers, which the Tests tool currently doesn't. This constrains my ability to prepare targeted automatic feedback using the Tests tool, through enthusiastic praise for right answers and supportive encouragement for wrong ones. I encourage Sakai developers to implement answer-specific feedback to fill this gap.

Diverse assessment

The summative assessment includes:
- Group work on a collaborative team page in Lessons (40%),
- Feedback to others on team pages (10%),
- Peer- and self-evaluation of their team page (10% each),
- An individual submission with the Assignments tool allowing students to implement changes prompted by feedback/evaluation (20%),
- A reflective component in the individual submission (10%, see Criterion 3).

C. Additional Supporting Evidence

Learning objectives & alignment

Learning objectives for the first part of week 5: Variability

- − Distinguish between information and noise
- − Propose sources of variation
- − Create a frequency histogram
- − Create a table of counts in R
- − Explain the difference between precision & bias

Related activities (first part of that week's Lessons page)

🟢 M1-3-05a Variability and accuracy (*reading & illustrative diagrams*)

It's time to consider patterns of variability in data, and how precision and bias combine to determine the accuracy of your measurements

💬 Fundamental concepts

Discuss and contrast examples of 'information' and 'noise' in your own conservation work

🟢 M1-3-05b Frequency histograms (*reading*)

Frequency histograms allow you to visualise the distribution of your continuous data

📄 E1-3-11_FrequencyHistogram.pdf

Create a frequency histogram in R to assess the distribution of your variable

🟢 M1-3-05c Accuracy: precision and bias (*reading & illustrative diagrams*)

The accuracy of your data is a combination of precision and bias

💬 Fundamental concepts

What sources of bias and/or lack of precision might exist in your own field data?

Assignment

To do well in the summative assignment, they need to address a variety of statistical issues such as bias in their data, and interpret patterns in frequency histograms of their data so that they can justify their choice of analysis.

Feedback

Example of automated feedback from formative Tests

You are working with pug-mark measurements for small cats. The paw prints are usually in the range of tens of millimetres (a few cm). You discover a typing error in one of your datapoints: the decimal point was too far to the right, giving a measurement of hundreds of millimetres (tiger-sized).

Your corrected measurement is unique (i.e. does not duplicate another value), and lies in the third quartile of your data (between 50 and 75%). Which of these statements is now true?

☐ A. The mode has decreased

✔☑ B. The median remains the same

✔☑ C. The mean has decreased

☐ D. The interquartile range has increased

☐ E. The range has increased

✔☑ F. The variance has decreased

☐ G. The standard deviation has remained the same

Answer Key: B,C,F

▾ 💡 Hints

You might find it useful to sketch a histogram of what the data could look like before and after correcting the data-entry error. Or even create some dummy data in R to play around with! The quickest way would be to create two simple vectors, one with a unrealistically large value, and the other with a corrected value.

💬 Feedback

- The **mode** will remain the same because your corrected datapoint does not duplicate another value, so it will not be the most common value.
- The **median** will remain the same because your datapoint is in the upper half of the dataset both before and after you corrected it.
- The **mean** would have been strongly influenced by the large positive outlier, and so correcting that value will lead to a reduction in the mean.
- This is a tricky one! The **interquartile range** will decrease because your corrected value will slot into the 3rd quartile, pushing the previous top value up into the 4th quartile. The 75th percentile is now represented by the next datapoint down - a slightly smaller value (assuming there weren't two identical datapoints on either side of the 75th percentile boundary before you corrected the error! 😊)
- The **range** will decrease because the erroneous outlier has been removed, so the data no longer stretch so high.
- The **variance** will have decreased, again because the large outlier has been removed.
- The **standard deviation** will decrease: it is affected in the same way as the variance, because it is calculated directly from it.

This example demonstrates why it is important to check whether your summary statistics give you sensible values for each of your variables before you do any analysis. Missing this typing error could completely change the results of any hypothesis-testing statistics!

Nathan (25-Nov-2014 14:34 GMT) Are you there, Lucy? I am just running the date correction scripts, and using your first line:

Nathan (25-Nov-2014 14:34 GMT) Edgar.dates <- LeafData$Date[LeafData$Collector == "Edgar Correa"] # Saves dates in different format to a new object, for formatting and reinsertion later

Nathan (25-Nov-2014 14:34 GMT) I am trying to figure out how it has created an object with 13 levels rather than the number of dates that Edgar collected the data from Nathan Roberts (25-Nov-2014 14:39 GMT) oh wait. I may have it! :) Edgar.dates was not an object of ONLY Edgar's dates, but one to store ALL original dates, and your final line of suggested code replaces only Edgar's?

Nathan (25-Nov-2014 14:48 GMT) BOOM! :) :) :) I think I've done it! :) I have realised my error from the weekend too. (Apologies for clogging the chat room - it's a good job there is no alert system with sounds for every message else we would all be sick of the sound already today! ha!) Thanks, Lucy.

Lucy Tallents (25-Nov-2014 14:57 GMT) Hee, I look away for half an hour and you've worked your way through multiple problems and solutions by yourself! :D

Lucy Tallents (25-Nov-2014 15:01 GMT) Edgar.dates only contains his five dates (use length(Edgar.dates) to check this), but it has inherited the number of levels of the original Dates column, which was a factor with 13 levels representing the dates from everyone's leaf-collecting forays

⬚ Nathan (25-Nov-2014 15:06 GMT) Ah ok, that makes sense. Thanks for clarifying how that worked. On with the next bit... :)

Criterion #5: Learner Support

A. Rating

___Not applicable

___Not evident

___Somewhat effective

_X_Effective

___Excellent

B. Evidence to Support My Rating

WebLearn (powered by Sakai) has a comprehensive set of student help pages, and students can click on the 'Contact us' link to request assistance with site tools.

The orientation Lessons page describes the different types of learning activity and gently introduces the Forums to build a supportive community before we arrive at the more difficult theoretical concepts and technical exercises. Students first encounter a collaboratively-edited Lessons page in the orientation (see Criterion 2), so they have time to become familiar with the main mode of their summative assessment.

In addition to support in using the online learning environment, I give information and opportunities for students to familiarize themselves with the skills to interact effectively with the technical course content. Forums and Chat provide on-demand technical support for software and coding issues (see Criterion 4). The practical exercise pdfs have detailed step-by-step instructions including screenshots to demonstrate what students should see, and I plan to extend this by embedding screencasts in HTML pages.

C. Additional Supporting Evidence

See evidence supplied for previous criteria.