K·STATE Research and Extension
Kansas State University

Current events articles enhance student learning in undergraduate genetics

Jennifer Minick Bormann and Megan M. Rolf

Kansas State University

Introduction

- ASI 500 Genetics
- Required by all ASI majors
- Also serves College of Agriculture
  - Primarily agronomy and horticulture
- Only pre-req is general biology

Introduction

- ASI 500 Genetics
  - Unit 1 - Mendelian inheritance, sex linkage, epistasis, pedigree analysis
  - Unit 2 - Chromosome structure, DNA structure and replication
  - Unit 3 - Transcription, translation, gene expression, biotechnology
  - Unit 4 - Genomics, quantitative and population genetics

Introduction

- Current events have potential to reinforce student learning
- Genetics is rapidly evolving, often in news
  - Mainstream
  - Ag related

K·STATE Research and Extension
Kansas State University

Objectives

- Does the incorporation of current events papers enhance student learning?

Materials and Methods

- Approved by KSU Institutional Review Board

- Fall semester 2013- 130 students

- Spring semester 2015- 139 students

K·STATE Research and Extension
Kansas State University

Materials and Methods

- Current events assignment Fall 2013
  - 5 different popular press articles related to genetics (current year)
    - Livestock, crop/horticulture plant, companion animal, exotic animal, human
  - Write 1 page paper describing the article and explaining how it related to concepts covered in class
  - Due at the end of semester

Materials and Methods

- Current events assignment Spring 2015
  - 4 different popular press articles related to genetics (current year)
    - Livestock, crop/horticulture plant, companion animal, exotic animal, NOT human
  - Write 1 page paper describing the article and explaining how it related to concepts covered in class
  - Due dates evenly distributed through the semester

K·STATE Research and Extension
Kansas State University

Materials and Methods

- Data collected
  - Pre-test and post-test for every unit (4)
    - Improvement from pre- to post-test
  - Cumulative GPA
  - Date paper submitted
  - Species of paper
  - Survey

Materials and Methods

- Data analysis
  - SAS (Cary, NC)
  - General linear model to analyze improvement included fixed effect of year and covariate of GPA
 - Chi-square test of survey results

Results and Discussion

| Variable	Fall 2013	Spring 2015	P-value
Improvement Unit 1	17.07	27.13	<0.01
Improvement Unit 2	39.81	36.55	0.05
Improvement Unit 3	30.46	40.49	<0.01
Improvement Unit 4	21.54	28.13	<0.01
Average improvement	26.62	32.82	<0.01

Results and Discussion

Number of current events assignments submitted by day of semester.

Results and Discussion

Number of current events assignments submitted by day of semester.

K·STATE Research and Extension
Kansas State University
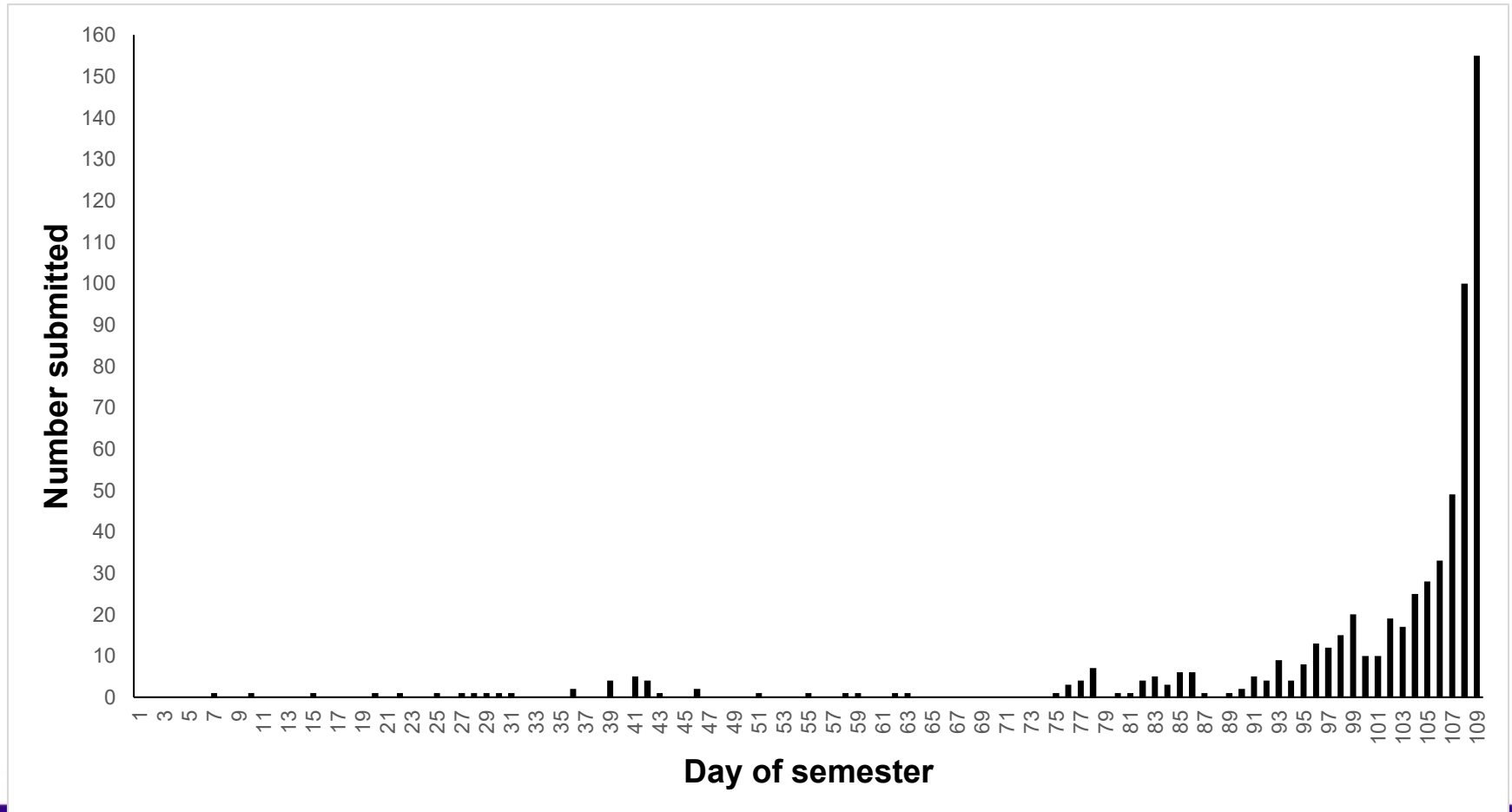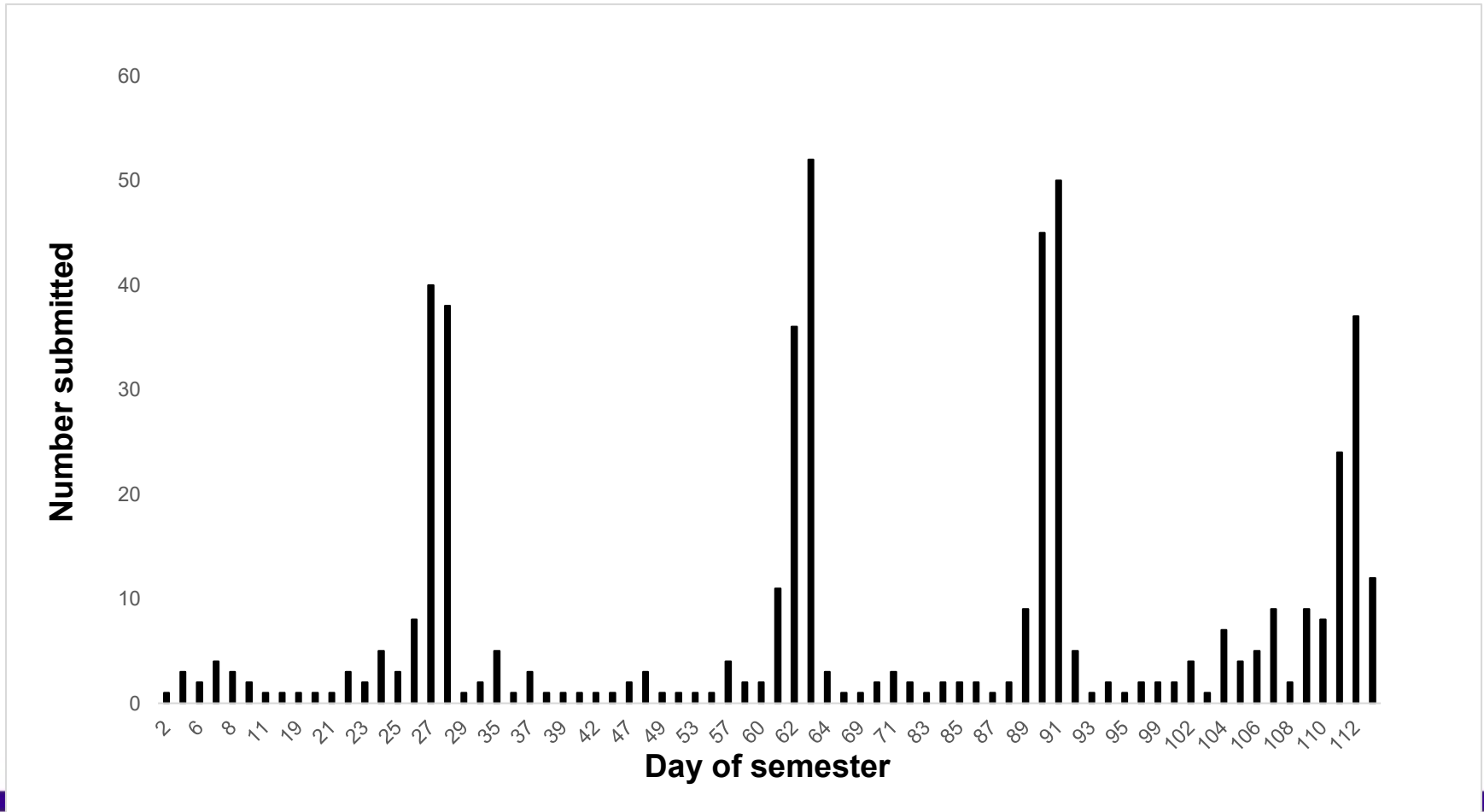
Species	Percent of students F13	Percent of articles F13	Percent of students S15	Percent of articles S15
Beef	61.83	6.04	63.63	26.10
Cat	38.17	0.35	17.42	1.92
Crops agronomy	38.17	5.01	27.27	17.27
Crops horticulture	29.77	2.25	13.64	3.45
Dairy	38.17	1.21	13.64	4.22
Dog	54.96	3.11	31.82	5.37
Exotic	35.11	5.18	20.45	14.40
Goat	29.77	0.17	9.09	0.96
Horse	55.73	4.32	31.82	5.18
Human	34.35	**55.44**	11.36	1.34
Poultry	27.48	0.17	7.58	1.54
Sheep	29.77	0	11.36	1.34
Swine	30.53	0.35	20.45	3.65

Results and Discussion

Student responses to survey question: On a scale from 1-5 with 1 being not helpful at all and 5 being extremely helpful, how useful were the current events articles in learning and reinforcing the concepts discussed in class?

Student response	Number F13	Percent F13	Number S15	Percent S15
1 not helpful	17	16.2	25	19.7
2	19	18.1	28	22.1
3	36	34.3	42	33.1
4	25	23.8	17	13.4
5 extremely helpful	8	7.6	15	11.8

NS

Results and Discussion

- Survey question: Did you find the majority of articles for class in your regular reading, OR specifically go looking for articles just to complete the assignment?

  – Fall 2013: 89.8% searching,10.2% regular reading

  – Spring 2015: 84.9% searching, 15.1% regular reading (NS)

Results and Discussion

- Survey question: How many magazine/newsletter/periodicals (print or electronic) related to your specie(s) of interest do you read regularly?
  - Fall 2013: 1.8
  - Spring 2015: 1.5 (NS)

Implications

- Student learning seemed to be improved when assignments were distributed throughout the semester.

- Students don't appear to be reading popular press related to their species of interest.

- Students believe reading articles and writing papers is only moderately helpful in learning genetics concepts.