

Running Head: Memory Maintenance

Memory Maintenance for Graduate Students

(A Preliminary Survey)

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University of Nebraska-Lincoln

Abstract

Forgetting seems to be a universal aspect of the human condition. This research proposal suggests that a random sampling of graduate students at the University of Nebraska-Lincoln be surveyed in an attempt to create a generalized perspective of student views. This survey would focus upon the the issue of retaining course-related knowledge after the graduate student has completed the courses.

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Introduction

Background

All individuals who have earned, or who are in the process of earning a graduate degree have taken numerous courses on a multitude of topics. Each course has likely had a syllabus with a set of objectives characterizing the knowledge that is to be possessed by each student upon completion of the course.

These graduate students read page after page of articles and textbooks. They complete projects, write papers, and take examinations. They work and study to successfully complete each of these. After each course is done, however, how much of the knowledge remains in these students' long term memory? How much was ever actually in long term memory in the first place? How important is that that knowledge to each student after the grade is recorded on their transcript? Does the knowledge present at the end of the course persist in an accessible form as time progresses? Does the thought of taking steps to maintain and retain knowledge from courses that have been previously taken ever even crossed the students' (or the instructor's) minds?

Purpose

The issue of memory maintenance is at the core of the questions raised previously in the Background section of this document. This is the issue that I am interested in investigating in the project proposed by this document. My ultimate interest is in researching a technology-based intervention that would assist people in maintaining and retaining desired knowledge sets. However, prior to embarking on such an effort, it seems prudent to investigate the related attitudes and perspectives of graduate students that can be gathered through a survey instrument.

The purpose of this qualitative study will be to explore perspectives on retaining course content knowledge that are held by current graduate students at the University of Nebraska-Lincoln.

This preliminary study will hopefully provide foundational qualitative background to establish whether or not this is an issue of concern and relevance to the population in question. In other words, is there a rationale for further investigation of potential instructional interventions that address this issue?

Literature Review

Even from the earliest days of cognitive research, the subject of forgetting has been a familiar focus. Spreading reviews of material over multiple sessions distributed throughout longer periods of time has repeatedly demonstrated promise in this arena; but is rarely utilized by instructors or students.

In the 1880's, Hermann Ebbinghaus (1913/1885) did a series of experiments in which he learned numerous series' of nonsense syllables (all the while recording the number of repetitions needed for perfect reproduction), waited a period of time, and then re-learned the series' (again noting the number of repetitions needed). Ebbinghaus found that number of repetitions needed to relearn any series of syllables decreased in a very predictable pattern. He also found that spacing out study sessions over more extended periods of time made his mastery of the sequences significantly more durable.

In the early 20th century, A.S. Edwards (1917) held total study time constant for two groups of elementary school children. One group's study time was conducted in a single session, while a second group's time was distributed over two occasions separated by several days. The distributed study group performed nearly 30 percent than the continuous group.

Frank Dempster's research (1987) on vocabulary learning reinforced the significant effects of presentations spaced over time. Compared to massed presentations of information, the experimental groups experiencing presentations distributed over time performed significantly better. One year later, Dempster (1988) wrote an analysis (an indictment) of the educational communities' failure to apply the "spacing effect" to regular classroom instruction.

A longitudinal study spanning 9 years (Bahrick, 1993) demonstrated that longer intervals between training sessions on Spanish vocabulary (56 days vs. 28 vs. 14 days) resulted in substantial differences in successful recall 5 years after practice ceased. In his discussion of that same study, Bahrick states that the curricula commonly in use at the time of his writing made little use of regular practiced retrieval of previously developed knowledge.

More recent research continues to look at the instructional implications for the "spaced review" effect. Lisa K. Son (2004) research the metacognitive choices that individuals make when deciding whether to mass together the review of content or space it out over more sessions and lengths of time.

Complex mathematical and decision-making models were used in an investigatory attempt to discover the optimal dispersal of review sessions. Pavlik and Anderson (2008) attempted to identify the frequencies of review that most efficiently make use of the spacing effect in the context of the time people have to study.

There are various applications that can be made in the context of classroom instruction. The spacing effect could be used within the context of classroom activities during the course of a semester. The same concepts could theoretically be utilized by individuals after they have completed a course; in an effort to retain and maintain the knowledge that they have gained.

Research Questions and Objectives

This study will be conducted through the distribution and collection of a survey instrument. It will be the goal of this study to answer the following research questions:

How frequently do graduate students at a large midwestern university use review strategies **after** a course is completed in an effort to maintain course content knowledge in long-term memory?

What motivates graduate students at a large midwestern university to utilize review strategies to maintain course content knowledge in long-term memory **after** a course is completed?

What methodologies and strategies do graduate students at a large midwestern university use to review course content knowledge **after** a course is completed?

Are graduate students at a large midwestern university aware of the long term potential of spaced review of course content?

Methods

Study Population, Sample Frame, and Sampling Plan

This study focuses upon graduate students at the University of Nebraska-Lincoln. While my particular interest is education, I do not wish to restrict my population to graduate students in the Education and Human Sciences College. This population covers all graduate and professional students at UN-L. Active students (registered for at least one class) from all the graduate colleges are within my population. According to the University of Nebraska-Lincoln 2007-2008 Fact Book, there were 4,920 registered graduate students in the fall of 2007.

Note: According to this Factbook, the graduate population contains the following breakdown of ethnicities and gender:

Black - 145
Native American - 30
Asian - 635
Hispanic - 138
White and Unknown - 3972

Male - 2336
Female - 2584

I will endeavor to sample from this population randomly, and will not seek to perform any stratified sampling procedures. This random selection from the entire population will reduce the possibility of coverage and sampling errors.

I made the decision to be satisfied with a 5% sampling error for this survey since this is a preliminary study. This reduces the needed sample size to 357 from the nearly 900 needed to achieve a threshold of a 3% sampling error.

I will be able to get names and contact email addresses for each of the active students in the UN-L graduate system from the office of graduate studies.

Once I have this information, I will create an alphabetical listing of these graduate students. Each of the students on this list will then be numbered sequentially from 1 to 4920. A random number table will be used to randomly select 393 individuals from the list. This number was determined by adding an additional 10% to the calculated sample size (357 plus 10 percent). This additional 10% is being added to the sample size in order to allow for a certain number of non-responses.

Variables and Measures

The variables to be measured by the proposed survey instrument will align with the research questions proposed earlier. The essence of these questions relate to four aspects of retaining course content knowledge after the completion of a course: frequency, motivation, strategies, and awareness of the concept of spaced review. One additional set of variables relating to participant demographics will also be investigated.

Most of the questions (4) on the survey instrument inquire in regards to the frequency that the issue of content knowledge maintenance arises. These four questions address how often this is an issue, how often actual steps have been taken, how much time is expended on this issue, and how frequent this issue has been addressed by instructors.

The next most frequent questions (3) on the instrument reflect demographic inquiries. These items provide contextual information regarding gender, degree program, and level of progress within the degree program.

Two questions focus upon motivational issues. These items ask individuals to gauge both the level of importance of retaining course content knowledge and the category of rationale for this motivation.

One question's main purpose is determine the review strategies that might already be in use by the population. This item provides six different categories of strategies that may or may not be employed by students in their efforts to retain course content knowledge.

One additional item inquires directly regarding students' awareness of the concept of spaced review.

Pilot Study Procedures

The development of the survey instrument involved three revision stages. These revision stages were conducted in an effort to develop the highest levels of reliability and validity.

First, a rough draft was developed and then made available to a group of my peers. Questions and comments on the overall purpose of the the study were offered. Informal replies and explanations in a discussion board format provided important food for thought to include in the cover letter and introduction to the survey.

Second, the revised draft was submitted to my course instructor. Comments here included adjustments of response ranges to remove overlap, re-ordering of questions to place more personal demographic questions at the end of the instrument, and expressions of outright skepticism as to the clarity and relevance of some of the questions.

Third, the further revised draft was then given to 5 currently active or prospective graduate students. They were asked to take the survey, respond to its items, and offer feedback on unclear items or responses. Numerous adjustments and needs for clarification were identified through this final step of the process. Orders of responses were adjusted, overlapping response ranges were corrected, and simple grammatical/typographical errors were fixed. An import clarification of two questions was requested by two pilot participants. As a result of this feedback a note was added to these two questions to communicate to the participants that it was possible to select more than one response.

Survey Procedures

On September 1st, 2008 a pre-notice letter will be mailed. This pre-notice letter will be mailed three days prior to the mailing of the actual survey.

On September 4th, 2008 the first mailing of the survey will take place. This mailing will include the cover letter, the questionnaire, a token of appreciation (a new one dollar bill), and a stamped return envelope.

On September 18th, 2008 a postcard providing both an additional expression of thanks and a friendly reminder to those who have not yet returned the survey.

On October 2nd, 2008 a letter will be mailed to non-respondents with a replacement questionnaire. This letter will firmly request the completion of the survey and will politely call attention to the fact that their copy of the survey has not yet been received. An additional expression of the study's importance will also be reiterated.


On November 2nd 2008 a final contact will be attempted through a priority mailing delivered through a Federal Express courier. If they choose to participate in the study at this point and do not have a paper copy of the questionnaire, an email containing a link to an online version of the survey will be sent.

Appendix

References

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- Dempster, F.N (1988). The spacing effect: a case study in the failure to apply the results of psychological research. *American Psychologist*, Vol 43, No 8, 627-634.
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- Pavlik, P.I. & Anderson, J.R. (2008). Using a model to compute the optimal schedule of practice. *Journal of Experimental Psychology*, Vol 14, No 2, 101-117.

IRB Form

	University of Nebraska-Lincoln Institutional Review Board (IRB) 312 N. 14 th St., 209 Alex West Lincoln, NE 68588-0408 (402) 472-6965 Fax (402) 472-6048 irb@unl.edu	FOR OFFICE USE ONLY IRB# _____ Date Approved: _____ Date Received: _____ Code #: _____
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IRB NEW PROTOCOL SUBMISSION

Project Title:	Memory Maintenance Survey For Graduate Students
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Investigator Information:

Principal Investigator:	Paul D. Lindgren	Secondary Investigator or Project Supervisor*:	Dr. David W. Brooks
Department:	Teaching, Learning, and Instruction	Department:	Teaching, Learning, and Instruction
Department Phone:	402.533.2897	Department Phone:	402.472.8888
Contact Phone:	402.981.6638	Contact Phone:	402.472.8889
Contact Address:	13317 Mathiesen Drive	Contact Address:	110 Henzlik Hall
City/State/Zip:	Blair, NE, 68008	City/State/Zip:	Lincoln, NE, 68025
E-Mail Address:	Pdindgren@gmail.com	E-Mail Address:	dwb@unlserve.edu

* Student theses or dissertations must be submitted with a faculty member listed as Secondary Investigator or Project Supervisor.

Principal Investigator is:

<input type="checkbox"/>	Faculty	<input type="checkbox"/>	Staff	<input type="checkbox"/>	Post Doctoral Student
<input checked="" type="checkbox"/>	Graduate Student	<input type="checkbox"/>	Undergraduate Student	<input type="checkbox"/>	Other

Type of Project:

<input checked="" type="checkbox"/>	Research	<input type="checkbox"/>	Demonstration	<input type="checkbox"/>	Class Project
<input type="checkbox"/>	Independent Study	<input type="checkbox"/>	Other	<input type="checkbox"/>	

Does the research involve an outside institution/agency other than UNL*?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
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* Note: Research can only begin at each institution after the IRB receives the institutional approval letter

If yes, please list the institutions/agencies.	
Where will participation take place (e.g., UNL, at home, in a community building, etc)	At home

Project Information:

Present/Proposed Source of Funding:	Not Applicable		
Project Start Date:	9/12/2008	Project End Date:	12/12/2008

*Please attach a copy of the funding application.

Type of Review Requested: Please check either exempt, expedited, or full board. Please refer to the investigator manual, accessible on our website: <http://www.unl.edu/research/ReComp1/compliance.shtml>, to determine which type of review is appropriate. **Final review determination will be made by the IRB.**

Please check your response to each question.

	Yes	<input checked="" type="checkbox"/>	No	1. Does the research involve prisoners?
	Yes	<input checked="" type="checkbox"/>	No	2. Does the research involve using survey or interview procedures with children (under 19 years of age) that is not conducted in an educational setting utilizing normal educational practices?
	Yes	<input checked="" type="checkbox"/>	No	3. Does the research involve the observation of children in settings where the investigator will participate in the activities being observed?
	Yes	<input checked="" type="checkbox"/>	No	4. Will videotaping or audio tape recording be used?
	Yes	<input checked="" type="checkbox"/>	No	5. Will the participants be asked to perform physical tasks?
	Yes	<input checked="" type="checkbox"/>	No	6. Does the research attempt to influence or change participants' behavior, perception, or cognition?
	Yes	<input checked="" type="checkbox"/>	No	7. Will data collection include collecting sensitive data (illegal activities, sensitive topics such as sexual orientation or behavior, undesirable work behavior, or other data that may be painful or embarrassing to reveal)?
	Yes	<input checked="" type="checkbox"/>	No	8. For research using existing or archived data, documents, records or specimens, will any data, documents, records, or specimens be collected from subjects after the submission of this application?
	Yes	<input checked="" type="checkbox"/>	No	8a. Can subjects be identified, either directly or indirectly, from the data, documents, records, or specimens?

Exempt **Expedited** **Full Board**

Description of Subjects:

Total number of participants (include 'controls'):

Will participants of both sexes/genders be recruited? Yes No

If "No" was selected, please include justification/rationale.

Will participation be limited to certain racial or ethnic groups? Yes No

If "Yes" was selected, please include justification/rationale.

What are the participants' characteristics?

Current graduate students at the University of Nebraska- Lincoln

PROJECT DESCRIPTION

FOR OFFICE USE ONLY
PROTOCOL:
DATE APPROVED:

<p>1. Describe the significance of the project.</p> <p>The purpose of this study is to assess how commonly the spacing effect (Ebbinghaus, Bjork) is utilized for long-term memory maintenance of course content after the completion of graduate-level classes among graduate students at UNL.</p> <p>The objectives of this study are three-fold:</p> <p>To determine how frequently the spacing effect is used to maintain course content knowledge by graduate students at UNL.</p> <p>To determine the reasons that particular course content is selected for regularly spaced review by graduate students at UNL.</p> <p>To determine the various methodologies that are used in the process of regularly spaced review by graduate students at a UNL.</p>

<p>2. Describe the methods and procedures.</p> <p><i>Describe the data collection procedures and what participants will have to do.</i></p> <p>Data collection will take place through the delivery, completion, and return of a structured, written survey. Participants will need to respond to a limited number of questions and return the questionnaire within an appropriate window of time.</p> <p><i>How long will this take participants to complete? 5-10 minutes</i></p> <p><i>Will follow-ups or reminders be sent? If so, explain.</i></p> <p>Reminders will only be sent to all participants a short time after the instruments are sent out. Reminders will then be sent only to non-responders.</p>
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<p>3. Describe recruiting procedures.</p> <p><i>How will the names and contact information for participants be obtained?</i></p> <p>Through the University of Nebraska Office of Graduate Studies.</p> <p><i>How will participants be approached about participating in the study?</i></p> <p>Participants will initially be contacted through email. If no response is given, standard mail and phone contacts will be attempted</p>
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<p>4. Describe Benefits and Risks.</p> <p><i>Explain the benefits to participants or to others.</i></p>
--

It is hoped that this research will benefit current students' educational program and will potentially improve future instruction and learning at the University of Nebraska-Lincoln.

Explain the risks to participants. What will be done to minimize the risks? If there are no known risks, this should be stated.

There are no known risks to this survey-based research study.

5. Describe Compensation.

Will compensation be provided to participants? Yes No

If 'Yes', please describe amount and type of compensation, including money, gift certificates, extra credit, etc.

Participants will be given a small token of appreciation (a \$1 bill) at the initial contact.

6. Informed Consent

Information regarding procedures, confidentiality, etc. will be provided along with the mailing of the questionnaire. An informed consent form will also be provided.

7. Describe how confidentiality will be maintained.

Any information gathered from this study will be kept strictly confidential. The individual paper-based information from this survey will be kept in a locked cabinet and will only be seen by the investigators during the study. Any digital versions of the data will be kept in an encrypted, password protected volume on any computer or device that it might reside. The raw data will only be kept for 3 years after the completion of the study. Aggregated data from this study may be presented in scientific journals or presented at scientific meetings.

8. Copies of questionnaires, survey, or testing instruments.

The Memory Maintenance Survey for Graduate Students -2008 is the instrument that will be utilized in this study

Checklist for the Informed Consent Form (cover letter, email, etc): Basic information that must be included

Project Description

X	Is the project title identified?
X	Is it stated that the study involves research?
X	Purpose of the research?
X	How long will it take to participate?
X	Why participant was selected?
X	Is the age of participant stated (under 19 needs parental consent)?
X	Are procedures described?
X	Where will it take place?
X	Are experimental procedures identified? (include if applicable)

Risks, Benefits, and Alternatives

X	Are risks and discomforts to participants explained? If no risks, does it say no known risks?
X	If there are risks, what will be done to minimize the risks? Referrals?
X	Are benefits to participants and to others that might be expected from the research explained?
X	Are alternative procedures or course of treatment that might be advantageous to the participant identified?
X	If the study offers course credit, are alternative ways to earn the credit explained?

Confidentiality

X	Will confidentiality of records identifying participant be maintained?
X	How will data be reported: scientific journal, professional meeting, aggregated data?

Compensation

X	Is compensation offered?
X	Are medical treatments available if injury occurs?
X	Who will pay for treatments (participant or department)?
X	What conditions would exclude participant from participating?

Right to Ask Questions

X	Is it stated that participants have a right to ask questions and to have those questions answered?
X	Are the names & phone numbers of persons to contact for answers to questions about the research provided?
X	Does it state who to contact concerning questions about research participants' rights, "Sometimes study participants have questions or concerns about their rights. In that case you should call the University of Nebraska-Lincoln Institutional Review Board at (402) 472-6965."

Freedom to Withdraw

X	Does it state, "You are free to decide not to participate in this study. You can also withdraw at any time without harming your relationship with the researchers or the University of Nebraska-Lincoln."
X	Does it state participation is voluntary?

Survey Cover Letter and Questionnaire



**THE LINDGREN CENTER
FOR INSTRUCTIONAL
RESEARCH**

13317 Mathiesen Drive
Blair, NE 68008

402.533.2897
pdlingren@gmail.com

<http://www.thelindgrencenter.com>

June 28, 2008

Goofus McFly

101 Infinite Loop
Cupertino, CA 95014

Dear Mr. McFly,

I am contacting you in order to request your help in a study of University of Nebraska-Lincoln graduate students that I am conducting as part of my doctoral dissertation. You were randomly selected from current and past UN-L graduate students in an effort to take a "snapshot" and gain a greater understanding of institutional teaching and personal learning practices. Results from this study can help future UN-L graduate students to participate in the graduate education process more effectively.

The responses that you provide will be kept completely confidential and will only be used as part of summaries in which no individual names will be identified. Immediately after the receipt of your responses, your name and address will be deleted from the list and never connected to your answers.

Taking a few minutes to complete this short survey is of vital importance to this project. However, if for some reason you are unable to provide these answers we request that you simply return the blank questionnaire in the stamped return envelope that is enclosed.

A small token of appreciation has been included in this mailing as a small thank you for your participation.

If you have any questions, comments, or concerns about this study we will be happy to discuss them with you. You may email me at: pdlingren@westside66.org or call me at 402.533.2897.

Thank you again for your assistance in this research.

Sincerely yours,

Paul Lindgren



INFORMED CONSENT FORM

IRB# (Labeled by IRB)

Identification of Project: Memory Maintenance Survey for Graduate Students.

Purpose of the Research: This is a research project that will gather individual graduate students' perspectives on the ongoing value of previously completed course curriculum content. You must be 19 years of age to participate. You are invited to participate in this study because you are a graduate student at the University of Nebraska- Lincoln.

Procedures: Participation in this study will take approximately 10 minute of your time. This brief survey enclosed simply needs to be completed and returned in the self-addressed, stamped envelope.

Risks and/or Discomforts: There are no known risks or discomforts associated with this research. In the event of problems resulting from participation in the study, psychological treatment is available on a sliding fee scale at the UNL Psychological Consultation Center, telephone (402) 472-2351.

Benefits: We hope that you will find satisfaction in contributing to this effort to improve the graduate instruction programs at the University of Nebraska-Lincoln.

Confidentiality: Any information gathered from this study will be kept strictly confidential. The individual paper-based information from this survey will be kept in a locked cabinet and will only be seen by the investigators during the study. Any digital versions of the data will be kept in an encrypted, password protected volume on any computer or device that it might reside. The raw data will only be kept for 3 years after the completion of the study. Aggregated data from this study may be presented in scientific journals or presented at scientific meetings.

Compensation: There is no compensation for participation in this study other than a small token of appreciation for considering to be a participant.

Opportunity to Ask Questions: It is your right to ask questions about this research and the research process prior to agreeing to participate. You may contact the investigator by email (pdlindgren@gmail.com) or by telephone (402.533.2897). If you have questions concerning your rights as a research subject that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Freedom to Withdraw: While we would sincerely appreciate your complete participation throughout the study, you are free to decide to not participate in this study or to decide to withdraw from the study at any time. This will not adversely affect your relationship with the investigators, the University of Nebraska or LPS. Your decision will not result in any loss or benefits to which you are otherwise entitled.

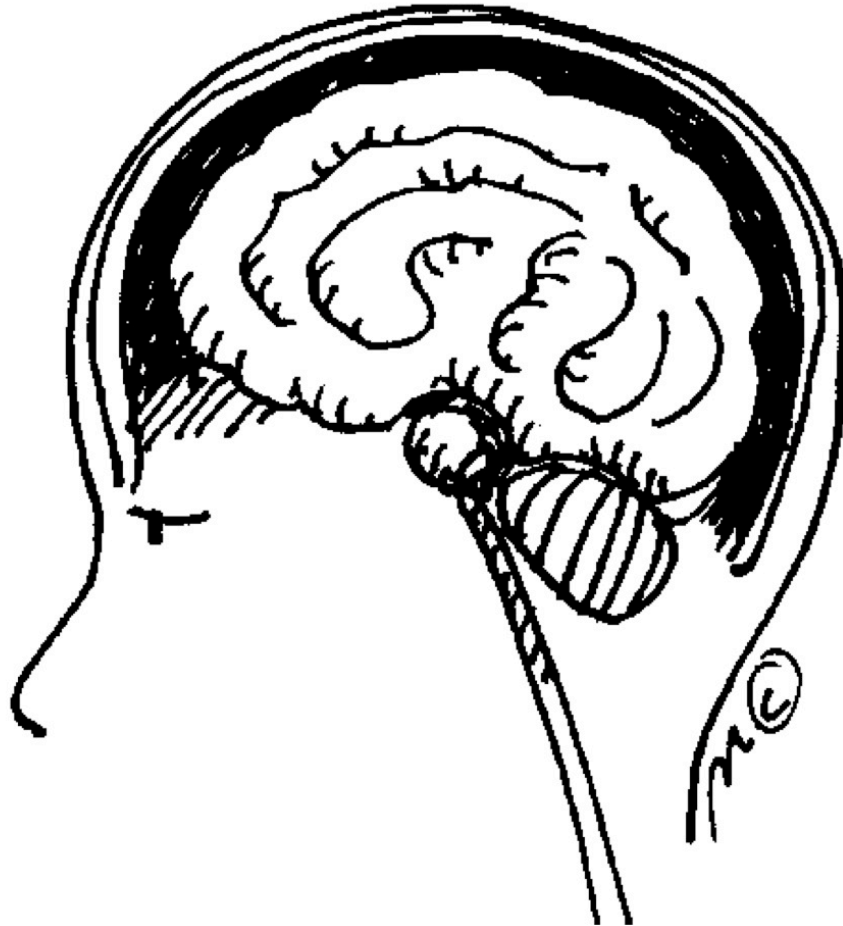
Consent, Right to Receive a Copy: It is your voluntary decision as a consenting adult to participate in this research study. Your signature in the space provided below signifies that you have decided to participate after having read and understood the information presented above. A copy of this consent form is available for you to keep.

Signature of Participant:

Signature of Research Participant

Date

Name and Phone number of investigator(s): Paul D. Lindgren (402.533.2897)-Principal Investigator



**MEMORY MAINTENANCE SURVEY
FOR GRADUATE STUDENTS -2008**

*The Lindgren Center for Instructional Research
13317 Mathiesen Drive, Blair NE 68008*

START HERE-Please place an “X” in the most appropriate response for each item below.

1. When taking graduate level classes, how important is it that you retain knowledge of course content after the class is completed?

- Extremely Important
- Somewhat Important
- Somewhat Unimportant
- Completely Unimportant

2. What estimated percentage of the graduate classes you have taken have motivated you to want to retain course content knowledge after the class is completed?

- 80-100%
- 60-79%
- 40-59%
- 20-39%
- 0 -19%

3. In what estimated percentage of graduate classes have you actually taken steps to retain knowledge of course content after the class is completed?

- 80-100%
- 60-79%
- 40-59%
- 20-39%
- 0 -19%

4. Estimate how many minutes a week you spend reviewing content from classes you have already completed.

- More than 90 minutes
- 60 – 90 minutes
- 30 – 59 minutes
- 0 – 29 minutes
- I never do this

5. In what estimated percentage of graduate level classes have instructors provided strategies for retaining knowledge of course content after the class is completed?

- 80-100%
- 60-79%
- 40-59%
- 20-39%
- 0 -19%

6. After completing graduate level classes, what most commonly motivates you to take steps to retain knowledge of course content after the class is completed?

Note: For this question, you may choose more than one item.

- Need to know content for subsequent class(es)
- Need to know content for work
- Need to know content for a personal task
- Desire to know content for personal satisfaction
- Am never motivated to retain course content
- Other: _____

7. If you purposefully review content from a graduate level class you have previously completed, which of the following best describes your review methodology?

Note: For this question, you may choose more than one item.

- Reread textbook or portions of a textbook
- Reread course notes or portions of notes
- Reviewed previously taken course quizzes or tests
- Reviewed/Reworked previously completed problems or questions
- Worked or completed new problems or questions
- Reviewed previously created personal artifacts (such as papers or projects)
- Other: _____

8. Are you aware of the concept that reviewing information at multiple sittings is better for retention in memory than a single, longer study session?

- Yes
- No

9. What is the degree objective of your graduate program?

- Masters
- Ph. D
- Ed. D
- Other: _____

10. Gender:

- Female
- Male

11. How soon do you expect to complete your degree program?

- Less than 1 year
- 1- 2 years
- 2-4 years
- 5 years or greater

Thank you for taking the time to complete this survey. Your help in providing this information is appreciated. This information is valuable because it offers an opportunity to improve teaching, instruction, and learning for other students. If there is anything else you would like to tell us in regards to this survey, please do so in the space provided below.

Please return your completed survey in the envelope provided to:

The Lindgren Center for Instructional Research
13317 Mathiesen Drive, Blair NE 68008

Item Abstract Tables

Questionnaire Abstract: Research Objectives

Research Questions	Survey Items
1. To determine how frequently graduate students at a large midwestern university use review strategies after a course is completed in an effort to maintain course content knowledge in long-term memory?	2 3 4 5
2. To determine what motivates graduate students at a large midwestern university to use review strategies to maintain course content knowledge in long-term memory?	1 6
3. To determine what methodologies graduate students at a large midwestern university use to review course content knowledge after a course is completed?	7
4. To determine if graduate students at a large midwestern university aware of the long term potential of spaced review of course content?	8
5. To determine the demographics of the population sample?	9 10 11

Questionnaire Abstract: Research Questions

Research Questions	Survey Items
1. How frequently do graduate students at a large midwestern university use review strategies after a course is completed in an effort to maintain course content knowledge in long-term memory?	2 3 4 5

2. What motivates graduate students at a large midwestern university to use review strategies to maintain course content knowledge in long-term memory?	1 6
3. What methodologies do graduate students at a large midwestern university use to review course content knowledge after a course is completed?	7
4. Are graduate students at a large midwestern university aware of the long term potential of spaced review of course content?	8
5. What are the demographics of the population sample?	9 10 11

Proposed Budget

1st Class Postage for Initial Mailing - \$.042

1st Class Postage for Survey Mailing - \$.042

1st Class Postage for Response Return - \$.042

1st Class Postage for Reminder/Thank you post card - \$.042

1st Class Postage for Final Follow-up mailing - \$.042

Estimated cost per participant for envelopes, printing, etc. - \$2.00

Token of appreciation (\$1 bill) - \$1

Total Estimated Cost per participant - \$5.10

Total Cost for 393 participants - \$2004.30

Note to self: Go digital next time! Use iTunes Store Gift codes as the small token of appreciation.