

2012/1

Reference: 

UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA  
Faculty of Education

## RESEARCH ETHICS COMMITTEE

This application form must be read together with the Code of Ethics for Research (Rt 429/99); Committee for Research Ethics and Integrity Policy and Procedures for Responsible Research (S 4083/00-amended) and the Postgraduate Policy of the Faculty of Education (S 4308/10)

### APPLICATION FOR ETHICS APPROVAL OF CONFIDENTIAL RESEARCH INVOLVING HUMAN RESPONDENTS

SECTION TO BE COMPLETED												
Section A: Research <input checked="" type="checkbox"/>					Section B: Research based on a community engagement project <input type="checkbox"/>							
Section C: Secondary analysis of existing data <input type="checkbox"/>					Section D: Commissioned research <input type="checkbox"/>							
Section E: Amendments to approved application (including changes to: instrumentation, co-researchers, participants) <input type="checkbox"/>												
APPLICANT'S DETAILS												
Surname		XXX		Name		XXX		Title		XXX		
Applicant's e-mail		XXX			Personnel/Student number			XXX				
Degree		XXX					Contact number		XXX			
Other applicants (if applicable)												
Surname		N/A		Name		N/A		Title		N/A		
Applicant's e-mail		N/A			Personnel/Student number			N/A				
Degree (if applicable)		N/A					Contact number		N/A			
Type of application		PhD <input type="checkbox"/>	MEd <input checked="" type="checkbox"/>	Honours <input type="checkbox"/>	Class approval <input type="checkbox"/>		Staff <input type="checkbox"/>	Supervisor e-mail (If applicable)		XXX		
Supervisor (if applicable)		XXX		Co-supervisor (if applicable)		XXX		First submission <input checked="" type="checkbox"/>		Resubmission <input type="checkbox"/>		
Department		ECE <input type="checkbox"/>		EMP <input type="checkbox"/>		EP <input type="checkbox"/>		HE <input type="checkbox"/>		SMTE <input checked="" type="checkbox"/>		
STATUS OF RESEARCH PROJECT												
Do you require a blind review of your application? (Staff members only)					Yes		<input type="checkbox"/>	No		<input checked="" type="checkbox"/>		
Proposal defended?		Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <sup>1</sup> <input type="checkbox"/>	Fieldwork started?		Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	Pilot study/Fieldwork concluded <sup>2</sup>		
		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <sup>3</sup> <input type="checkbox"/>
QUALIFICATIONS AND EXPERTISE OF THE RESEARCHER (S)												
Please provide information regarding your experience and qualifications in research												
Relevant prior experience		XXXX										
Previous academic qualifications		XXX										
Is professional registration required for any part of the research?							Yes <input type="checkbox"/>		No <input checked="" type="checkbox"/>			
Provide details of registration authority and registration number							N/A					
DETAILS OF THE RESEARCH PROJECT												
Title of project		XXXX										

<sup>1</sup> Only applicable to secondary data analysis

<sup>2</sup> <http://web.up.ac.za/default.asp?ipkCategoryID=8045&sub=1&subid=6258&ipklookid=6>

<sup>3</sup> Only applicable to secondary data analysis

<b>Research design</b> (Mark with an X)	Qualitative <input checked="" type="checkbox"/>	Quantitative <input type="checkbox"/>	Mixed methods <input type="checkbox"/>	Action research <input type="checkbox"/>	Other <input type="checkbox"/>
<b>Data collection/ Data Sources</b> (Mark appropriate boxes with an X)	Questionnaires/ Survey <input type="checkbox"/>	Document analysis <input checked="" type="checkbox"/>	Structured interviews/ <input type="checkbox"/>	Semi-structured interviews <input checked="" type="checkbox"/>	Open ended interviews <input type="checkbox"/>
	Non-participatory observation/ Notes <input checked="" type="checkbox"/>	Participatory observation/ notes <input type="checkbox"/>	Intervention/ Therapy <input type="checkbox"/>	Experimental <input type="checkbox"/>	Other Achievement tests/ Achievement data <input type="checkbox"/>

**RESEARCH CONTEXT AND PARTICIPANTS**

<b>Level of sensitivity/ Intrusiveness</b> (Mark with an X)	<b>HIGH</b> <input type="checkbox"/> (Participation requires intrusive and sensitive information about participants' mental/psychological health and/or their relationship with a person/institution with power over them)	<b>MEDIUM</b> <input checked="" type="checkbox"/> (Participation requires divulging of personal information but is not regarded as sensitive/intimate)	<b>LOW</b> <input type="checkbox"/> (Participation requires information about policies/modules/courses/ institutional processes with a view to analysing, assessing and evaluating them as artefacts)	
	<b>Indicate to which category participants belong</b> (Mark all applicable descriptions)	1. <input checked="" type="checkbox"/> Under 18 years (minors)	2. <input checked="" type="checkbox"/> Over 18 years (adults)	3. <input type="checkbox"/> Orphaned, separated or unaccompanied minors
	4. <input type="checkbox"/> Extreme poverty or illiterate	5. <input type="checkbox"/> HIV/AIDS	6. <input type="checkbox"/> Mentally compromised or physical limitations	
	7. <input type="checkbox"/> Limited proficiency in language used to conduct this research			
<b>Primary research setting</b>	1. <input type="checkbox"/> Pre-school	2. <input checked="" type="checkbox"/> School	3. <input type="checkbox"/> Higher education	4. <input type="checkbox"/> Private organisation
	5. <input type="checkbox"/> Individual	6. <input type="checkbox"/> Family	7. <input type="checkbox"/> Clinic/Mental Health/Hospital	8. <input type="checkbox"/> Community

**FUNDING OF RESEARCH PROJECT**

XXX

**DETAILS OF CO-RESEARCHER (S)**

N/A

XXXX

\_\_\_\_\_  
**Signature of Applicant**

XXXX

\_\_\_\_\_  
**Date**

XXX

\_\_\_\_\_  
**Signature of Co-supervisor (if applicable)**

XXX

\_\_\_\_\_  
**Date**

XXX

\_\_\_\_\_  
**Signature of Supervisor (if applicable)**

XXX

\_\_\_\_\_  
**Date**

XXX

\_\_\_\_\_  
**Signature of Head of Department**

XXX

\_\_\_\_\_  
**Date**

XXX

\_\_\_\_\_  
**Signature of Departmental Representative**

XXX

\_\_\_\_\_  
**Date**



Reference:	
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**PERSONAL DECLARATION OF RESPONSIBILITY**

**Title of research project:**

**XXXX**

1. I/We declare that I am/we are cognisant of the goals of the Research Ethics Committee in the Faculty of Education to:
  - Develop among students and researchers a high standard of ethics and ethical practice in the conceptualisation and conduct of educational research;
  - Cultivate an ethical consciousness among scholars especially in research involving human respondents; and
  - Promote among researchers a respect for the human rights and dignity of human respondents in the research process.
  
2. I/We subscribe to the principles of
  - Voluntary participation* in research, implying that the participants might withdraw from the research at any time.
  - Informed consent*, meaning that research participants must at all times be fully informed about the research process and purposes, and must give consent to their participation in the research.
  - Safety in participation* put differently, that the human respondents should not be placed at risk or harm of any kind e.g. research with young children.
  - Privacy*, meaning that the *confidentiality* and *anonymity* of human respondents should be protected at all times.
  - Trust*, which implies that human respondents will not be subjected to any acts of deception or betrayal in the research process or its published outcomes.
  
3. I/We understand what plagiarism entails and am/are aware of the University's policy in this regard. I/We undertake not to make use of another person's previous work without acknowledgment or to submit it as our own. I/We also undertake not to allow anyone to copy our work with the intention of using it as their own work.
  
4. I/We understand that the data collected in the course of our research become the property of the University of Pretoria and I/we undertake to transfer all raw data and documents related to our research for safekeeping as required by the Faculty of Education.
  
5. I/we understand that any amendment to the approved protocol needs to be submitted to the Ethics Committee for review prior to data collection. Non-compliance implies that approval will be null and void.

XXX

XXX

\_\_\_\_\_  
**Applicant**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**

XXX

XXX

\_\_\_\_\_  
**Co-supervisor (if applicable)**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**

XXX

XXX

\_\_\_\_\_  
**Supervisor (if applicable)**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**



Answer all questions honestly in full. The reviewers base their decisions on the information provided on this application form. Incomplete applications cannot be evaluated fairly. Please provide the Ethics Committee with a typed application that addresses the following ethical considerations.

**Please note: Only complete THE RELEVANT SECTION APPLICABLE TO YOUR RESEARCH PROJECT**  
**SECTION A: RESEARCH PROJECT INVOLVING HUMAN RESPONDENTS**  
**SECTION B: COMMUNITY ENGAGEMENT PROJECT**  
**SECTION C: SECONDARY ANALYSIS OF EXISTING DATA**  
**SECTION D: COMMISSIONED RESEARCH**  
**SECTION E: AMENDMENTS TO APPROVED APPLICATION (INCLUDING CHANGES TO INSTRUMENTATION, CO-RESEARCHERS, PARTICIPANTS)**

## SECTION A: RESEARCH PROJECT INVOLVING HUMAN RESPONDENTS

### 1. DESCRIPTION OF RESEARCH

1.1 Please provide a brief summary of the proposed research initiative. Include the main research question(s), rationale for this inquiry as well as its scientific importance. Mention the benefits which are likely to be derived from the project as well as its anticipated duration.

#### Overview of the study

Plants are considered an essential part of the environment and play a key role in supporting life on earth (Fancovicova and Prokop, 2010). Often little attention and appreciation are shown towards plants and the community have the propensity to harbour negativity towards plants which leads to “plant blindness” (Wandersee and Schussler, 1999). The term “plant blindness” refers to the approach in which people form preconceived inferences and negative attitudes towards plants, furthermore the integral part plants play in our daily lives is overlooked. This proposed study aims to investigate whether “plant blindness” occurs among South African Natural Science teachers when teaching botany. Botany, a component of the Natural Science learning area will serve as the focus in this study, as little is known about South African teacher's attitudes and PCK towards Botany teaching and the origin of those attitudes. This study will not only focus on Grade 4 to 6 Natural Science teachers' attitudes toward botany teaching, but investigate the state of their botany related Pedagogical Content Knowledge (PCK), and whether there exists a relationship between their attitudes and their PCK. This exploratory study will make use of semi structured teacher interviews, classroom observations and document analysis of Grade 4 to 6, Natural Science teachers' botany related lesson plans.

#### Research questions

##### Main Question:

What is the relationship between Natural Science teachers' attitudes and PCK toward botany teaching?

##### Sub-questions:

What are Grade 4 to 6 Natural Science teachers' attitudes toward botany teaching and why do they harbour these particular attitudes?

What teaching strategies and instructional methods do Natural Science teachers use to teach botany in their classrooms and why do they choose these methods?

How do teacher attitudes toward botany teaching impact their botanical PCK?

### Rationale

Hardly any research on PCK has been completed regarding South African Natural Science teachers' attitudes toward botany. Many studies have internationally placed their focus on science teachers' PCK (Abell, 2007 cited in Khetsiwe, 2010: 10). Furthermore the available studies mostly focus on the development of pre service science teachers' PCK mainly in the field of chemistry.

Considering the pervasive role of plants in our daily lives, there is the need to explore Natural Science teachers' PCK and its relationship to their attitudes in the context of botany education. South African Natural Science teachers' knowledge, skills and attitudes toward botany were investigated by Goodwin (2008:16), which provides the only evidence regarding South African Natural Science teachers' PCK of botany. Results from Goodwin (2008:16) showed that science teachers need to be knowledgeable in all aspects of botany education to teach it effectively.

There is a need to explore the extent of Natural Science teachers' PCK in botany education in primary schools. According to Goodnough and Hung (2009) PCK of science teachers should be a focus in order to enhance effective teaching. Magnusson, Borko and Krajcik (1994 and Magnusson and Krajcik, 1993; Khetsiwe, 2010) considered a teachers' PCK as a contributing factor towards successful education when complicated concepts are taught in science. This study will focus on teacher attitudes toward botany teaching, the state of these teachers' botanical PCK and the manner in which teacher attitudes impact botanical PCK.

### Estimated duration of this study

Ethical clearance	April to May
Data collection	May and June (depending on Ethics clearance)
Data analysis	June and July
Chapter 1 Introduction	Present to June
Chapter 2 Literature review	Present to July
Chapter 3 Research methodology	Present to August
Chapter 4 Findings and discussion	September to October
Final draft	October to November
Submission	November/ January

### References

Abell, S.K., 2007. Research on science teacher knowledge. In Abell, S.L., and Lederman, N.G. (Eds.). Handbook of research on science education: 1105-1149. Mahwah, NJ: Lawrence Erlbaum.

Fancovicova, J., and Prokop, P., 2010. Development and initial psychometric assessment of the plant attitude questionnaire. *Journal of Science Education and Technology*. 19: 414-421.

Goodnough, K., and Hung, W., 2009. Enhancing pedagogical content knowledge in elementary science. *Teaching Education*. 3 (20): 229-242.

Goodwin, D.E., 2008. An exploration of factors facilitating and hindering change in the teaching of botany in primary schools. Unpublished PhD Thesis. Pretoria: University of Pretoria.

Khetsiwe, M.E., 2010. Exploring science teachers' pedagogical content knowledge in the teaching of genetics in Swaziland. Unpublished PhD degree proposal. Pretoria: University of Pretoria.

Magnusson, S., Krajcik, H., and Borko, H., 1993. Nature, sources and development of PCK, in J. Gess-Newsome & N.G. Lederman (Eds.). Examining PCK: 95-132. Dordrecht: Kluwer Academic.

Magnusson, S., Borko, H., and Krajcik, 1994. Teaching complex subject matter in science: Insights from an analysis of pedagogical content knowledge. Paper presented at annual meeting of the National Association for Research in Science Teaching. Anaheim. CA, March 1994

Wandersee, J.H., and Schussler, E.E., 1999. Preventing plant blindness. American Biology Teacher. 61:84-86.

## 2. RESEARCH METHODOLOGY

2.1 Please provide a full description of the research design/methodology, and processes that will be used. Include details relating to the research sites and data collection protocols.

The research design

In this proposed study an interpretivist paradigm seems to be the best approach to follow. Interpretivism focuses on different forms of reality that will be adopted from findings (Hartley, 2010). Interpretivism also places impetus on people's lived experiences and subjective nature of knowledge and understanding. Maree (2010) states that an interpretivist approach pursues a worldview where attitudes are influenced by people's subjective experiences. In order to conduct this study there exists the need to explore and understand the way in which teachers' attitudes are constructed in their everyday teaching environment.

The research approach that will be utilized in this proposed study is of a qualitative nature. A multiple case study research design is selected to facilitate the proposed study's qualitative approach.

Sample criteria

The unit of analysis will include three purposive selected primary schools in Gauteng, Ekurhuleni with conveniently available Grade 4 to 6 Natural Science teachers. These teachers form part of a homogenous sample who teach botany as part of the Grade 4 to 6, primary school, Natural Science curriculum. This homogenous sample of teachers attempts to include a provisional number of two Grade 4 to 6 Natural Science teachers per school, from each of the three schools. This research will be conducted in the Gauteng province, in the Ekurhuleni area as because it is accessible to the researcher.

The researcher will approach the principals and teachers of the different schools before commencing with the research. Once permission is obtained teachers will be contacted and will receive letters of informed consent. If permission is not granted other schools will be approached.

Data collection

Qualitative data collection in this proposed study includes three techniques. The first strategy includes the utilization of one-on-one semi structured interviews with a set of predetermined questions to the total number of six Grade 4 to 6 Natural Science teachers in each of the three selected schools. The interview responses will be tape recorded for data collection and analysis purposes only. Interviews will be held after school in a noise free area for about 30 minutes to an

hour. The interview protocol is attached.

The other strategy to be used in this proposed study's data collection is document analysis, a type of data collection that will consist of botany related lesson plans designed by the Natural Science teacher. A copy of botany related lesson plans will be sought from each of the six Grade 4 to 6 Natural Science teachers from the three selected schools.

Classroom observations serve as a useful method for data collection that will take place after interviewing. The observational role most suited for this proposed study will be the role of a nonparticipant observer who does not interfere with activities or become familiar with the participants' methods. The role of this type of observer is to remain objective in terms of the observational site, participants and their methods (Creswell, 2007). Observations will be held in the teaching time of a botany related lesson with reference to the copied lesson plans. In this study the teacher will be observed whilst the learners are present in class. The learners will not be the focus of this study, but parents/guardians and learners will receive information letters regarding the research in the particular school. The observational protocol is attached

#### Data analysis

Qualitative data collected from six teacher interviews will be transcribed to textual data and saved to computer files with the help of the ATLAS ti computer programme. A preliminary exploratory analysis will give the researcher an overall idea of the data (Creswell, 2007). The interview data as well as the documents will be coded into a priori codes emerging from the literature studied and grouped within themes. Analysed data will be represented and reported in various tables. Demographic tables together with comparison tables consisting of related themes will be represented for each school separately. After each table a short narrative discussion will follow in order to make sense of the teachers' attitudes toward botany teaching, other aspects of PCK and whether there exists a relationship between their attitudes and those aspects.

2.2 Should clinical data form part of the data source in this study, detail the relevant processes for obtaining permission and informed consent to use such data.

N/A

2.3 If this is intervention research, describe the nature of the intervention and provide details about the scientific merit of the intervention you intend to study.

N/A



Please note that you have a responsibility to ensure that you disclose fully the scientific status of the intervention to your participants when you invite them to participate in your research. Participants have the right to know to which degree the procedures and instruments you intend to use are accepted by the scientific community.

### 3. HUMAN PARTICIPANTS

3.1 Describe who will be participating in the study. Mention any other special criteria that may apply to your study.

Role	Vulnerability status	Institutional affiliation	Justification for participation
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6 Natural Science teachers	Adults, over 18, competent to give consent	Various school in Gauteng	Teachers participate through interviews, classroom observations and providing copies of botany related lesson plans. They will provide information regarding teacher attitudes and their PCK in botany teaching
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A



Please ensure that you attach to this application a draft letter of invitation to participate in the research on a UP letterhead for each group of participants in your study. Make sure that the content of the letter reflects the content of issues outlined in this application. The letter of invitation must be signed by the student and supervisor(s) but should not be signed by the participants yet.

**3.2 Describe your sampling procedure. Include how you will recruit and select participants. Attach as addenda any draft versions of adverts/letters inviting participation in your project.**

#### Sampling

The unit of analysis will include three purposive selected primary schools in Gauteng, with conveniently available Grade 4 to 6 Natural Science teachers. These teachers form part of a homogenous sample who teach botany as part of the Grade 4 to 6, primary school, Natural Science curriculum. This homogenous sample of teachers attempts to include a provisional number of two Grade 4 to 6 Natural Science teachers per school, each from each of the three schools. This research will be conducted in the Gauteng province, in the XXX area because it accessible to the researcher.

The researcher will approach the principals and teachers from the different schools before commencing with the research. Once permission is obtained teachers will be contacted and will receive letters of informed consent. If permission is not granted other schools will be approached.

Letters of informed consent to principals and teachers are attached, also letters of information to the parents/guardians and learners.

**3.3 Please provide additional information on the criteria that will be used as the basis for inclusion/exclusion of certain participants.**

The context of this proposed study includes English and Afrikaans, co-educational primary schools, with a specific interest in Grades 4 to 6, Natural Science teachers in the Intermediate phase of education, in the Gauteng province in XXX of South Africa.

The interviews will be conducted in Afrikaans and English, depending on the language preference of the teachers.

**3.4 Outline in what activities participants will be expected to participate as part of this research project. Indicate the duration of each activity as well as where it will take place.**



N/A

Participants	Activities	Venue/Community site (if applicable)	Duration
6 Grades 4 to 6 Natural Science teachers	Semi structured interviews, audio taped and conducted according to the interview protocol	A convenient venue to both participant and researcher, with little distractions and noise for audiotaping the interview	30 - 60 minutes
6 Grade 4 to 6 Natural Science teachers	Document analysis of copied botany related lesson plans	The Natural Science teacher's classroom, during a botany related lesson	Lesson plans consisting of approximately 30 minutes teaching time
6 Grade 4 to 6 Natural Science teachers	Non participant class observations audio taped according to the observational protocol	The Natural Science teacher's classroom, during a botany related lesson	Approximately 30 minutes

3.5 Should any of the participants be known to you in another context (apart from this research) provide details of this relationship and detail how you will handle the conflict of interest.

The researcher has no contact or prior relationship with any of the schools or teachers.

3.6 Should participants be deceived, please describe the nature of any deception and provide a rationale why it must be used in this inquiry. Please note that deception includes but is not limited to the following: deliberate presentation of false information, suppression of pertinent information, selection of information designed to mislead, selective disclosure of information.

No deception will be used

3.7 Should you make use of any assistants such as interpreters, photographers, or scribes, please detail their involvement in the study. Include information regarding any orientation/training that such persons will receive prior to commencing their duties.

Only the researcher and supervisor will have access to any information and data collected.



Please note that it is your responsibility to ensure that all assistants and interpreters fully understand and adhere to all ethical requirements of the project. Please attach a personal declaration of responsibility for each assistant/interpreter who works on the project.

3.8 Is there the likelihood of a particular sort of "heinous discovery"? (E.g. child abuse, discovery of illness or condition) If so, how will you deal with such a situation?

No heinous discovery is anticipated

#### 4. CONSIDERATION OF ETHICAL PRINCIPLES REGARDING HUMAN PARTICIPANTS

##### VOLUNTARY PARTICIPATION AND TRUST

4.1 Describe how you will ensure voluntary participation.

Teachers will receive letters of informed consent (attached) that will state their right to voluntary participation. The principals will only be informed about the research that will be conducted in the school, but will not know which teachers will participate or not. This will be applicable to the semi structured interviews, but the principal will be aware of the teachers participating in classroom observations.

4.2 Should any of the participants constitute a captive audience<sup>4</sup>, state what additional safeguards you will take to ensure voluntary participation.

No participants will be captive. Learners will be present in the venue of the class observation, but will not form part of the research. A letter of information (attached) will be handed to these learners and their parents/guardians.

4.3 Should any incentives be used please describe and justify these and outline what measures you will take to still ensure voluntary participation.

No incentives will be used.

4.4 Will participants be asked to comment on drafts (e.g. transcripts of interviews)

Teachers will be asked to comment on the teacher interviews, in a form of member checking.

4.5 How will participants be informed that they are free to discontinue at any time? Will the nature of the project place any limitations on this freedom? (e.g. documentary film)

Teachers can choose to withdraw participation at any time during the research. This will be explained in the letters of informed consent.

##### INFORMED CONSENT/ASSENT

4.6 Please describe how you will obtain informed consent/assent from your participants (or their care givers). Attach a draft consent form or oral consent script as an addendum.

- **Informed consent from adults/assent from minors**

Informed consent will be sought from the principals and Grades 4 to 6, Natural Science teachers in the form of the letters of informed consent attached to this application. Learners will also receive information about the research, explaining the presence of the researcher in the classroom, in the form of a letter.

<sup>4</sup> Captive Audience: Participants are potentially obligated to participate in the study due to the researchers' position of authority (power) in relation to participants (e.g. learners and educator-researchers, students and lecturer-researchers, educators and government/district officials as researchers, clients and psychologist-researchers). Thus participation may in fact not be voluntary and may also limit participants' anonymity and confidentiality.

▪ **Informed consent from parents/guardians**

Parents/guardians will receive information in the form of a letter (attached), information will include the researcher and supervisor's contact numbers and email addresses for any questions or queries prior to the research.

4.7 In some cultural traditions, individualised consent as implied above may not be appropriate or additional consent (e.g. group consent or consent from community leaders) may be required. If this is the case with your sample population, indicate the procedures you will follow to obtain consent.

All the schools will be chosen from a suburban background. It is not foreseen that this research will require this type of consent.

4.8 Should some participants in the study be considered to be mentally compromised or otherwise not competent to consent to participation, detail what safeguards you will take to ensure voluntary participation.

The participants are Grade 4 to 6 teachers in government primary schools and are expected to be competent to participate.

4.9 Should the research not be conducted in the mother tongue of the participants or in a language in which they feel competent, detail the measures you will take to ensure informed consent and voluntary participation.

Data will be collected in English or Afrikaans or both, depending on the medium of instruction in the school and the preference of the teacher. Informed consent letters and data collection instruments will be translated either in English or Afrikaans.

**SAFETY IN PARTICIPATION**

4.10 Detail the possible benefits and/or consequences that participants can expect as a result of participating in this study.

No benefits, but possible reflection of their teaching in the botany field of the Natural Science learning area in terms of lesson preparation and their outlook toward botany teaching

4.11 Detail the potential risks and harm to participants in this study.

It is unlikely that the teachers will be harmed, but might feel uncomfortable during the interviews and observations. Teachers might also fear discovery of incompetence with regards to teaching.

4.12 Describe the safeguards you will take to minimise these risks, however minor.

It will be made clear that teachers can withdraw at anytime or can choose not to answer a question. Anonymity will also be guaranteed and data will not be linked back to them.

4.13 If you have indicated that you will involve participants from vulnerable contexts, detail which extra safeguards you will take to protect your participants from harm, and how you will monitor for possible adverse effects.

Learners are not the participants, but present during the class observation. Parents/guardians will be informed. Learners will also receive an information letter and the presence of the researcher will be explained to them by the teacher. Teachers will be in charge of the class as usual creating a familiar context for the learners.

#### **PRIVACY, CONFIDENTIALITY AND ANONYMITY**

4.14 Detail how you will ensure confidentiality and/or anonymity in the sample selection phase of the study.

The selected schools and teachers will be provided with pseudonyms in the study. The names of the schools and teachers will only be known to the researcher.

4.15 Should the privacy of participants not be protected in this research, have participants actively agreed to forego confidentiality requirements based on full disclosure of possible intended and unintended consequences and risks? Detail the conditions under which participants decided to forego their privacy rights.

No, but the principal may be aware of participation of the teachers, as observations will be scheduled during class time. However, teacher participants will be made aware of this.

4.16 Detail practical steps you will take to ensure confidentiality and/or anonymity in the data collection phase of the study.

Pseudonyms will be provide for both schools and teachers participating in this study. Other colleagues may become aware of the presence of the researcher at the school.

4.17 Detail practical steps you will take to ensure confidentiality and or anonymity in the dissemination phase of the study.

Data obtained will be used to write a dissertation. No information will be provided to identify the participants as pseudonyms will be used for both the schools as well as the teachers.. Anonymity and confidentiality will be ensured.

**CONFIDENTIALITY OF RESULTS OR FINDINGS**

4.18 Please mark the box which best describes the level of access you, as the researcher(s), will have to your participant(s) identity(ies):		
<input type="checkbox"/>	Fully anonymous	Researcher(s) will not be able to identify who participated at all. Demographic information collected will be insufficient to identify individuals.
<input type="checkbox"/>	Anonymous results, but can identify who participated	The participation of individuals will be tracked (e.g. to provide course credit/chance for a prize etc) but it would be impossible for collected data to be linked to individuals.
<input type="checkbox"/>	Pseudonym	Data collected will be linked to an individual who will only be identified by a fictitious name/code. The researcher(s) will not know the true identity of the participant.
<input checked="" type="checkbox"/>	Confidential	Researcher(s) will know the true identity of participant(s), but this identity will not be disclosed.
<input type="checkbox"/>	Disclosed	Researcher(s) will know and will reveal true identity of participants in results/published material.
<input type="checkbox"/>	Participant choice	Participants will have the option of choosing which level of disclosure they wish for their true identity.
<input checked="" type="checkbox"/>	Anonymity in dissemination	Participants' identities will not be revealed in the dissemination of the research.
<input type="checkbox"/>	Other (please describe)	1. The researcher(s) and student participants will know the true identity of each other, but this identity will not be revealed in the dissemination of the research.
<input type="checkbox"/>		2. Learners will not be previously known to the researcher(s) and students
<input type="checkbox"/>		3. Written permission will be obtained should participants wish to have their names on the video recording/cover (see 5.17).

**ADDITIONAL COMMENTS**

4.19 Bearing in mind the ethical guidelines of your academic and/or professional association, please comment on any other ethical concerns which may arise in this research (e.g. responsibility to subjects beyond the purposes of this study).
N/A

**5. INSTITUTIONAL APPROVAL**

5.1 Indicate whether you have received permission to conduct this research from the relevant authority such as provincial Department of Education/Higher Education Institution/School			
Institution	YES	NO	Comments
Gauteng Department of Education	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
School principals and teachers	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Permission will be sought once Ethics approval has been granted. The research will not commence before permission is obtained.
N/A	<input type="checkbox"/>	<input type="checkbox"/>	N/A

5.2 If the research is conducted in a country other than South Africa, please detail the relevant legislation pertaining to the requirements for informed consent if these differ from South Africa.
N/A



Please note that you must prepare a draft letter in which you request permission to conduct research. It must be addressed to the principal or senior official head of each research site you intend to use. The letter must accompany this application and may only be sent after ethical approval has been granted.

**6. DATA DISSEMINATION**

6.1 Please describe how you intend to share the findings of your research with academia and the broader community (e.g. conferences, articles, seminars, dissertation, reports).
The findings will be used to write a dissertation and an article. The research might also be

presented at conferences.

## 7. DATA ACCESS AND STORAGE

7.1 Please describe the access participants will have to the study results and any debriefing information that will be provided to participants post participation.

Interview transcriptions will be available for member checking. The findings and discussion will be stated in Chapters 4, 5 and 6 of the dissertation and will be available on request.

7.2 Please describe the audit trail of your data from collection to storage to its eventual archiving or disposal. Include specific details on who will have access, short and long-term storage (format and location), and final destination. For full details please consult the policy documents referred to on page 1.

Interviews will be tape recorded and the tapes will be in the researcher's possession. The transcriptions will be done on the researcher's own computer and will be available to the supervisor. Observation protocols will be on paper and in the researcher's possession. Documents and copies of lesson plans will be on paper and in the researcher's possession.

All these documents and data will be kept in a safe place in the researcher's own study in a locked cupboard. After completion of the research, all material will be stored in the SMTE department with regards to required storage according to the policy requirements of the university.

**ACKNOWLEDGEMENTS**

We have drawn on the example obtained from the Office of Research at Concordia University, Montreal Canada while refining this form.

**FOR THE APPLICANT(S):**

	Yes	No
• Have you disclosed all relevant information which may reasonably have an impact on the decisions made by the Ethics Committee?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Do you declare that you have not yet engaged with fieldwork in this study?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Are you aware that it is your responsibility to ensure that all documents relevant to this study, such as letters of permission and informed consent must be retained for safekeeping?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Are you informed about Faculty and UP and professional regulations of ethical behaviour?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Have you checked that all the appropriate role-players have signed in the appropriate places?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Do you undertake to inform research assistants, transcribers and translators (if applicable) of the ethical principles and institutional requirements guiding this research and ensure that they sign the personal declaration of responsibility prior to their involvement in the research?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Have you included a <b>protocol letter of invitation to participate</b> that will provide the conditions of participation and informed consent and handed to the school/ organisation/institution and participant(s) and signed by the applicant and the supervisor(s)?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Have you included copies of the data collection protocols, such as questionnaires and/or interview schedules if applicable?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Have you ensured that the process for obtaining informed consent complies with the relevant legal and professional requirements?	<input checked="" type="checkbox"/>	<input type="checkbox"/>
• Do you declare that all information provided in this application is true?	<input checked="" type="checkbox"/>	<input type="checkbox"/>

XXX

\_\_\_\_\_  
**APPLICANT**

\_\_\_\_\_  
**SIGNATURE**

XXX

**DATE**

XXX

\_\_\_\_\_  
**CO-SUPERVISOR**  
(if applicable)

\_\_\_\_\_  
**SIGNATURE**

XXX

**DATE**

XXX

\_\_\_\_\_  
**SUPERVISOR**  
(if applicable)

\_\_\_\_\_  
**SIGNATURE**

XXX

**DATE**



Dear teacher,

I am a student studying through the University of Pretoria. I am currently enrolled for my BEd(Masters) in the Faculty of Education. I have to complete a research module and one of the requirements is that I conduct research and write a research report about my work. I would like to ask you whether you will be willing to participate in this research.

The topic of my research is: **Natural Science teacher attitudes and Pedagogical Content Knowledge for teaching botany.** Plants play an essential role in our environment and they provide humans with many benefits that we need to survive. It is vital that learners understand, value, and learn to protect the plants around them, but research has shown that learners and teachers often suffer from what is called ‘plant blindness’. Some research has been done on this topic in overseas countries, but we hope to find out what the situation is in primary schools South Africa. The research will include an analysis of Grade 4 to 6, Natural Science teachers’ teaching of botany by means of interviews and observations.

If you agree to participate, you will be interviewed about this topic. The interview will take place at a venue and time that will suit you, but it may not interfere with school activities or teaching time and will not take longer than an hour. The interview will be audio taped and transcribed for analytic purposes.

Document analysis of your botany related lesson plans will also form part of this research. I will require a copy of a botany related lesson plan from you. This information will only be accessed by myself and my supervisor and will be regarded as confidential and anonymous.

I would also like to observe your Grade 4 to 6, Natural Science class. These observations will be conducted during your choice of botany related teaching time, and the researcher’s role will remain objective during this process. The observations will be audio taped and transcribed for analytic purposes. Only my supervisor and I will have access to this information. The learners will not form



part of the research, although they will be present in the class. Learners and their parents/guardians will receive letters to inform them about the research.

You do not have to participate in this research if you do not want to, and you will not be penalised in any way if you decide not to take part. If you decide to participate, but you change your mind later, you can withdraw your participation at any time.

Your identity will be protected. Only my supervisor and I will know your real name, as a pseudonym will be used during data collection and analysis. Your school will not be identified either. The information you give will only be used for academic purposes. In my research report and in any other academic communication, your pseudonym will be used and no other identifying information will be given. Collected data will be in my possession or my supervisor's and will be locked up for safety and confidential purposes. After completion of the study, the material will be stored at the university's Science Mathematics and Technology Education Department according to the policy requirements.

If you agree to take part in this research, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via E-mail.

Signature of student

---

Name of student: XXX	XXX (Supervisor)
Contact number for student: XXXX	XXXX
E-mail of student: XXXX	XXXX

## Consent form

I, \_\_\_\_\_(your name), agree / do not agree (delete what is not applicable) to take part in the research project titled: **Natural Science teacher attitudes and Pedagogical Content Knowledge for teaching botany**. I understand that I will be interviewed about this topic for approximately one hour at a venue and time that will suit me, but that will not interfere with school activities or teaching time. The interview will be audio taped.

I understand that botany related lesson plans will be copied and analysed by the researcher, also that one of my Grade 4 to 6 Natural Science classes will be observed about this topic for the duration of a period according to my teaching time, the role of the researcher will remain objective and non invasive, the observations will also be audio taped.

I understand that the researcher subscribes to the principles of:

- Voluntary participation* in research, implying that the participants might withdraw from the research at any time.
- Informed consent*, meaning that research participants must at all times be fully informed about the research process and purposes, and must give consent to their participation in the research.
- Safety in participation*; put differently, that the human respondents should not be placed at risk or harm of any kind e.g., research with young children.
- Privacy*, meaning that the *confidentiality* and *anonymity* of human respondents should be protected at all times.
- Trust*, which implies that human respondents will not be respondent to any acts of deception or betrayal in the research process or its published outcomes.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_



Dear Headmaster,

I am a student studying through the University of Pretoria. I am currently enrolled for my BEd(Masters) in the Faculty of Education. I have to complete a research module and one of the requirements is that I conduct research and write a research report about my work. I would like to ask you whether you will be willing to allow me to conduct a part of this research in your school.

The topic of my research is: **Natural Science teacher attitudes and Pedagogical Content Knowledge for teaching botany**. Plants play an essential role in our environment and they provide humans with many benefits that we need to survive. It is vital that learners understand, value, and learn to protect the plants around them, but research has shown that learners and teachers often suffer from what is called 'plant blindness'. Some research has been done on this topic in overseas countries, but we hope to find out what the situation is in primary schools South Africa. The research will include an analysis of Grade 4 to 6, Natural Science teachers' teaching of botany by means of interviews, observations and document analysis of botany related lesson plans.

If you agree to allow me to conduct research in your school, I will interview two Grade 4 to 6, Natural Sciences teachers. I attached a copy of the interview schedule for your information. Interviews will be conducted at a venue and time that will suit the teacher, but it may not interfere with teaching time. It will be audio taped and transcribed by me for analytic purposes. Only my supervisor and I will have access to this information.

Document analysis of Natural Science teachers' botany related lesson plans will also form part of this research. I will require a copy of a botany related lesson plan from the teacher. This information will only be accessed by myself and my supervisor and will be regarded as confidential and anonymous.

I would also like to observe two Grade 4 to 6, Natural Science teachers' classes. These observations will be conducted during botany related teaching time, and the researcher's role will remain objective during this process. The observations will be audio taped and transcribed by me for analytic purposes. Only my supervisor and I will have access to this information. A copy of the observation protocol will be attached for your information.

The learners will not take part in the research but will be in attendance of the class together with the researcher. The learners and parents or guardians will receive a letter to inform them about the research that will be conducted. Teacher participation is voluntary and can be withdrawn at any time. The identity of the school and all participants will be protected. Only my supervisor and I will know which schools were used in the research and this information will be treated as confidential. Pseudonyms will be used for your school and teachers during data collection and analysis. The information that will be collected will only be used for academic purposes. Collected data will be in my possession or my supervisor's and will be locked up for safety and confidential purposes. After completion of the study, the material will be stored at the university's Science Mathematics and Technology Education Department according to the policy requirements. In my research report and in any other academic communication, pseudonyms will be used for the school and teachers and no other identifying information will be given. If you agree to allow me to conduct this research in your school, please fill in the consent form provided below. If you have any questions, do not hesitate to contact my supervisor or me at the numbers given below, or via E-mail.

Signature of student

---

Name of student: XXX	XXX (Supervisor)
Contact number for student: XXXX	XXXX
E-mail of student: XXXX	XXXX

Consent form

I, \_\_\_\_\_(your name), Headmaster of \_\_\_\_\_ agree / do not agree (delete what is not applicable) to allow XXXX to conduct research in this school. The topic of the research being: **Natural Science teacher attitudes and Pedagogical Content Knowledge for teaching botany .**

I understand that two Grade 4 to 6, Natural Science teachers will be interviewed about this topic for approximately one hour at a venue and time that will suit the teacher, but will not interfere with school activities and teaching time. The interview will be audio taped.

I understand that two Grade 4 to 6, Natural Science teachers' lesson plans will be analysed and classes will be observed about this topic for the duration of a period according to my and the teachers' teaching time, the role of the researcher will remain objective and non invasive, the observations will also be audio taped. Stand that learners and their parents/guardians will receive letters of information regarding this topic.

I understand that the researcher subscribes to the principles of:

- ❑ *Voluntary participation* in research, implying that the participants might withdraw from the research at any time.
- ❑ *Informed consent*, meaning that research participants must at all times be fully informed about the research process and purposes, and must give consent to their participation in the research.
- ❑ *Safety in participation*; put differently, that the human respondents should not be placed at risk or harm of any kind e.g., research with young children.
- ❑ *Privacy*, meaning that the *confidentiality* and *anonymity* of human respondents should be protected at all times.
- ❑ *Trust*, which implies that human respondents will not be respondent to any acts of deception or betrayal in the research process or its published outcomes.

Signature:\_\_\_\_\_

Date:\_\_\_\_\_

## Appendix A

### The teacher interview protocol

The relationship between Natural Science teacher attitudes and Pedagogical Content Knowledge for teaching botany

Time of interview: \_\_\_\_\_ Duration: \_\_\_\_\_

Date: \_\_\_\_\_

Place: \_\_\_\_\_

Interviewer: \_\_\_\_\_

Interviewee: \_\_\_\_\_ Pseudonym: \_\_\_\_\_

Male / Female: \_\_\_\_\_

Plants play a critical role in our society in all aspects. The purpose of this study is to contribute to the research of primary school science teachers' PCK in the learning area of natural science of the Intermediate phase, with emphasis related to botany. PCK (Pedagogical Content Knowledge) refers to the manner in which the teacher successfully carries his/her content knowledge across by means of instructional methods, and teaching strategies. Pseudonyms will be utilized in the interviews, data analysis and the findings. The data collected in this study will serve in research purposes only and treated as confidential. Access to the data will be granted to the researcher and the supervisor only. Please sign the consent form at the back of this document. Thank you for your participation.

#### Questions:

1. Describe how botany was part of your past teacher training.
2. How did you experience botany in your past teacher training?
3. How do these experiences influence your attitude towards botany teaching?
4. Describe our attitude toward botany teaching in the Natural Science classroom.
5. Which parts of the Natural Science curriculum do you prefer to teach?
6. Which parts of the Natural Science curriculum are of less preference in teaching?
7. Describe the teaching strategies that you use when teaching botany.
8. Do you integrate technology, for example Power Point presentations, in the botany teaching in the classroom, explain?
9. To what extent is the use of different teaching strategies in your class considered as important to you as a Natural Science teacher?
10. What techniques or teaching strategies do you use to keep learners interested in the classroom when teaching Botany?
11. How do you ensure that learners will understand topics that you are teaching in botany?
12. How do you assess learners' learning and understanding of a specific topic in botany, with reference to assessment strategies?
13. Do you think the National Curriculum Statement (2003) place enough emphasis on botany related concepts?
14. Do you think a teacher's attitude toward botany can show a relationship with their PCK? How?

### Onderwyser onderhoud schedule

Die verhouding tussen Natuurwetenskap onderwysers se houdings en pedagogiese inhoudskennis teenoor plantkunde onderrig

Tyd van onderhoud: \_\_\_\_\_ Duur van onderhoud: \_\_\_\_\_

Datum van onderhoud: \_\_\_\_\_

Plek van onderhoud: \_\_\_\_\_

Onderhoudvoerder: \_\_\_\_\_

Deelnemer: \_\_\_\_\_ Skuilnaam: \_\_\_\_\_

Manlik / Vroulik: \_\_\_\_\_

Plante speel 'n belangrike rol in ons omgewing in alle aspekte. Die doel van die studie is om by te dra tot die navorsing van laerskool wetenskaponderwysers se Pedagogiese Inhoudskennis in die leerarea van natuurwetenskap in die Intermediêre fase, met 'n spesifieke fokus op plantkunde. Pedagogiese Inhoudskennis verwys na onderwysers se vermoë om die inhoudskennis op die beste manier oor te dra aan die leerders met behulp van verskillende strategieë, bronne en metodes. Skuilname sal gedurende die onderhoud, data versamelings prosedure en bevindinge van die studie gebruik word vir u beskerming. Die data van hierdie studie word slegs vir navorsingsdoeleindes gebruik en word as konfidensieel beskou. Slegs die navorser asook die studieleier sal toegang tot die navorsing hê. Teken asseblief die vorm op die agterkant van hierdie dokument. Dankie vir u deelname.

#### Vrae:

1. Verduidelik asseblief hoe plantkunde 'n deel gevorm het van u onderwysopleiding.
2. Hoe het u plantkunde ervaar in u onderwysopleiding?
3. Hoe beïnvloed hierdie ervaring met plantkunde u houding teenoor plantkunde onderrig in u klas?
4. Verduidelik u houding teenoor plantkunde onderrig in die Natuurwetenskap klaskamer.
5. Identifiseer u gunsteling dele in die Natuurwetenskap kurrikulum ten opsigte van onderrig.
6. Identifiseer u minder gunsteling dele in die Natuurwetenskap kurrikulum ten opsigte van onderrig.
7. Vertel asseblief meer oor die tipes onderrig strategieë wat u gebruik in plantkunde onderrig.
8. Integreer u tegnologie, bv. "Power Point presentations" wanneer u plantkunde onderrig? Verduidelik asseblief.
9. Tot watter mate is die gebruik van onderrig strategieë in plantkunde onderrig belangrik vir u as Natuurwetenskap onderwyser?
10. Watter tegnieke of onderrig strategieë gebruik u om die leerders se aandag te behou in die klas wanneer u plantkunde onderrig?
11. Hoe verseker u dat leerders konsepte verstaan wat u hulle leer?
12. Hoe sal u leerders se begrip oor 'n spesifieke deel van plantkunde meet, ten opsigte van assessering strategieë?
13. Dink u dat die Nasionale Kurrikulum Verklaring (2003) genoegsame klem plaas op plantkunde?
14. Dink u dat 'n onderwyser se houding teenoor plantkunde hulle Pedagogiese Inhouds Kennis kan beïnvloed? Hoe?

**Appendix B**

**Observational protocol**

Topic of study: \_\_\_\_\_

Classroom number: \_\_\_\_\_ Pseudonym: \_\_\_\_\_

Name of observer: \_\_\_\_\_

Role of observer: \_\_\_\_\_

Time of observation: \_\_\_\_\_

Length of observation: \_\_\_\_\_

Plants play a critical role in our society in all aspects. The purpose of this study is to contribute to the research of primary school science teachers' PCK in the learning area of Natural Science of the Intermediate phase, with emphasis related to botany. Pseudonyms will be utilized in the observations, data analysis and the findings. The data collected in this study will serve in research purposes only and treated as confidential. Access to the data will be granted to the researcher and the supervisor only. Please sign the consent form at the back of this document. Thank you for your participation.

<b>Descriptive fieldnotes</b>	<b>Reflexive fieldnotes</b>
<p>Classroom checklist:</p> <ul style="list-style-type: none"><li>• Botany posters</li><li>• Live plants</li><li>• Plant experiments</li></ul> <p>Participants</p> <p>Class lesson</p> <p>PCK Strategies:</p> <p>Plants as examples:</p> <p>Misconceptions:</p> <p>Knowledge of plants:</p>	



Activities

**Concluding comments or remarks:**