Project ID 3340

Te Komiti mō ngā Tāngata Whai Pānga Matatika o te Whare Wānanga o Tāmaki Makaurau
UAHPEC
University of Auckland Human Participants Ethics Committee

Introduction
Whakataki

Completing the UAHPEC application:

Prior to completing your application:

- Check the eligibility criteria for the three ethics committees available to the University of Auckland researchers for review of research studies involving human participants, and complete the appropriate committee's application form. Eligibility criteria for Health and Disability Ethics Committees (HDECs) are described in their Standard Operating Procedures, and the University's Guiding Principles for Conducting Research with Human Participants (section 3.1) list the criteria for submissions to UAHPEC and the Auckland Health Research Ethics Committee (AHREC)
- Read the Guiding Principles for Conducting Research with Human Participants.
- Go through the UAHPEC Applicants' Reference Manual.
- Check if an exemption applies (see Guiding Principles section 3.1.1)
- Visit the UAHPEC web page for more information about support available for the development and submission of your UAHPEC application
- Questions in the application form marked with an asterisk * are mandatory.

Assistance available:

- For any technical queries, please log a call with the Staff Service Centre at ext. 86000 or staffservice@auckland.ac.nz and the query will be referred to either the Ethics and Integrity team or the Ethics RM support team.
- Ethics advisors in your Department or Faculty are available to consult about ethical issues related to your specific study. A list of Ethics advisors is available from the UAHPEC web page.
- For assistance with completing the application form, you can also contact the Ethics and Integrity team for more information about UAHPEC processes and review, at humanethics@auckland.ac.nz

Please note: The research may not start until approval from UAHPEC has been obtained.

Acknowledgement:

1. The Ethics and Integrity team wants to convey our appreciation to everyone who contributed to the development and implementation of the new Infonetica Ethics RM form. Please provide feedback either directly to the team or in the relevant application form section.
2. We acknowledge with appreciation Matua Te Wharekōtua Turuwhenua for providing the Māori translations of the Section headings in the application form.

Eligibility for UAHPEC review:
Te Māraurautanga mō te Arotakenga o ngā Tāngata Whai Pānga Matatika o te Whare Wānanga o Tāmaki Makaurau:

Does your study involve Clinical/Health research?
Definition of "clinical research" is available in the information icon.

○ Yes ◉ No

Is your research study an audit of clinical data only?

○ Yes ◉ No

Will human tissue be used or collected as part of the study?

○ Yes ◉ No

Click the 'Next' action tile on the left hand side of the screen to continue with the UAHPEC application.

Section 1 : Applicants
Tekihana 1 : Ngā Kaitono

1.1. Project Title:* Understanding the effect of programming expertise on code review task outcomes

1.2. Is this a Research or Coursework application?*

○ Coursework
◉ Research

1.3. Principal Investigator Contact Details:*
For Coursework applications, add the Course Director's information

Title Assoc Prof

First Name* Ewan

Last Name* Tempero

Department* Computer Science

Faculty* Science

Email* e.tempero@auckland.ac.nz

1.4. Is this a research study with students as participants in a University class where the Course Director permission is required?*

○ Yes ◉ No

1.5. Are there any other investigators involved in the project (excluding student researchers)?*

◉ Yes ○ No

1.5.a. List all other investigators (excluding student researchers), their affiliation(s) and role in the project:

Title Dr.

First Name* Kelly

Last Name* Blincoe

Department* Department of Electrical, Computer, and Software Engineering

Faculty* Engineering

Email* k.blincoe@auckland.ac.nz

Role in the project* Other

Explain* Co-supervisor

1.6. Will a student researcher or researchers be involved in the project?*

◉ Yes ○ No

1.6.a. Will this research study contribute to a degree or qualification for any of the student researcher or researchers?*

◉ Yes ○ No

1.6.b. Provide the name, contact details and project role of each of the student researcher(s):

Name and Contact details:

Title Ms

First Name* Sanuri

Last Name*	Gunawardena
Student ID*	863216116
Department / School*	Computer Science
Faculty and University*	Science
Email*	sanuri.gunawardena@auckland.ac.nz
Degree / Qualification*	Doctor of Philosophy

1.7. Is this a research study using only secondary data?*

○ Yes ◉ No

Section 2 : Study Description
Tekihana 2 : He aha te akoranga

2.1. What is/are the principal question(s) or hypothesis the study will address?*

Describe the purpose, hypothesis/research questions and objectives of the research in plain language (language that is comprehensible to a lay person and free from jargon or undefined technical terms).

Code review is one of the most effective quality management techniques existing today. It is the process of proof-reading programming code. Researchers are continuously trying to provide better forms of assistance for code reviewers to make code review more effective and feasible. However, by its very nature, code review is costly. Also, the code review workload is often imposed on the programming experts, adding to its cost. A "Systematic Mapping Study", a form of Systematic Literature Review (SLR), and an online survey that we conducted to understand the gap between the code reviewers' needs and the support that is being provided by the existing assistance revealed that the code review cost was a prevailing challenge in modern code review (MCR). Thus, we propose to reduce code review costs by reducing the code review workload imposed on programming experts and getting less expensive resources to review code. Non-programmers As a preliminary confirmed this.

Non-programming-experts can be cheaper resources compared to the programming-experts. Thus, if we can delegate at least some of the code review workload to the non-programming-experts, the cost of code review can be further reduced. Our goal is to determine the possibility of non-programming-experts reviewing code. Thus, we conducted a preliminary online survey to understand the similarities and differences between decision making (related to code review), of different programming expertise levels. The results implied that non-programming-experts, in fact, can make code review decisions similar to programming experts. Therefore, we are conducting an experiment for which we are hereby seeking approval.

The purpose of our study is to investigate if non-experts also can contribute to code review instead of just programming-experts. Therefore, the research question that we are seeking answers for is, "Can non-programming-experts contribute to code review?". The objective is to investigate the possibility of code review tasks being conducted by non-programming-experts.

2.2 Summary of the study:*

Software Inspection is an important task of modern, quality-driven software development. Being first formally introduced by Michael Fagan[1], the software inspection process has changed over time from a heavy-weight, manual process to a light-weight, tool-assisted process in order to keep up with the modern software development that requires a faster delivery of software products. However, due to its qualitative nature, code review requires a high human involvement and is difficult to fully automate. As a result, assistance for code reviews such as tools, techniques, and processes have not evolved at the same pace as the assistance for other software development activities. There is enough evidence in the literature suggesting that irrespective of the support available, code review is still costly [2,3,4,5,6,7]. We propose to reduce the code review cost by utilizing non-programming-experts (i.e. cheaper human resources) in code review instead of depending only on programming-experts. The goal of this experiment is to check the possibility of non-programming-experts to review code without reducing the reliability of code review.

In summary, we are seeking permission to invite participants (programmers and non-programmers), to take part in an experiment and to publish data that is collected through this experiment. This data will effectively capture their voluntary participation. The responses will be aggregated and anonymized in any report.

[1] M. Fagan, "Design and Code Inspections to Reduce Errors in Program Development," in Software Pioneers, Berlin, Heidelberg: Springer Berlin Heidelberg, 2002, pp. 575-607.
[2] A. Bacchelli and C. Bird, "Expectations, outcomes, and challenges of modern code review," Proc. - Int. Conf. Softw. Eng., pp. 712-721, 2013.
[3] J. Wang, P. C. Shih, and J. M. Carroll, "Revisiting Linus's law: Benefits and challenges of open source software peer review," Int. J. Hum. Comput. Stud., vol. 77, no. C, pp. 52-65, May 2015.
[4] T. Baum, O. Liskin, K. Niklas, and K. Schneider, "Factors influencing code review processes in industry," in Proceedings of the 2016 24th ACM SIGSOFT International Symposium on Foundations of Software Engineering - FSE 2016, 2016, pp. 85-96.
[5] A. Bosu, J. C. Carver, C. Bird, J. Orbeck, and C. Chockley, "Process Aspects and Social Dynamics of Contemporary Code Review: Insights from Open Source Development and Industrial Practice at Microsoft," IEEE Trans. Softw. Eng., vol. 43, no. 1, pp. 56-75, Jan. 2017.
[6] L. MacLeod, M. Greiler, M. A. Storey, C. Bird, and J. Czerwonka, "Code Reviewing in the Trenches: Challenges and Best Practices," IEEE Softw., vol. 35, no. 4, pp. 34-42, Jul. 2018.
[7] C. Sadowski, E. Söderberg, L. Church, M. Sipko, and A. Bacchelli, "Modern code review," in Proceedings of the 40th International Conference on Software Engineering Software Engineering in Practice - ICSE-SEIP '18, 2018, pp. 181-190.

2.3 How will the study contribute to new knowledge?*

Our study will determine whether people with different programming expertise levels can contribute to code review rather than just programming-experts. This will allow organizations to rely on cheaper human resources instead of the programming-experts only, reducing the overall cost of code review. The possibility of reducing the code review cost further through the proposed method will be tested empirically in this experiment.

2.4. Describe the study design:*

High-level description of study design: This experiment will involve a zoom or a similar online session between the researcher and the participant where the participant will have to complete several code review tasks guided by a web form while thinking out loud i.e. expressing his or her thoughts as they occur. The tasks involve the detection of a set of defects that are usually detected during code reviews. The experiment process is illustrated in the attached document, "Flowchart.pdf".

Detailed study Design: The participants will be of two types: programmers vs. non-programmers. In both cases, participants will be recruited via online platforms such as social media and online forums, group email threads, a physical poster, and snowballing. Anyone aged 18 years or more can participate in this experiment. 50 programmers and 50 non-programmers will be recruited. The experiment participation is voluntary and no special permissions are required to recruit the participants. The tasks that the participants have to do are based on the type of participant (programmer or non-programmer). Two PIS, and web form versions were created for the two participant types. The poster and the email were written in a way that both types of participants are invited to participate.

The researcher will distribute the invitation (emails, online posts, poster) to participate in the experiment along with a question: "Do you have computer programming knowledge or experience?". The participants who are willing to know more about the experiment and how to participate may contact the researcher by email with the answer to the question. Then, the researcher will send the relevant participant information sheet (PIS) to the participant based on his or her type (programmer vs. non-programmer) together with the consent form. The participant is excepted to reply with the signed consent form, the PIS, and his or her availability details if he or she is willing to participate in the experiment. Afterward, the researcher will finalize the experiment date and time and inform the participant. A list of participants' name, email, and a unique code will be maintained in a separate file. The experiment data of the participant will be reported in another separate file against the same unique code assigned for the participant. This will help to identify the participant's response for removal if the participant chooses to withdraw.

As already explained, the participants will be of two types: Programmers and Non-programmers. The materials used by the participant to conduct the tasks will differ based on the type of participant. The non-programmer participant will have to complete a set of code review tasks online , guided by the web form designed for the non-programmers. The programmers will complete a set of code review tasks both online and in their local computer, using the original source code and guided by the web form designed for the programmers. In both cases, the participant is expected to think aloud (or express his or her thoughts as they occur) about the decisions he or she will make during the experiment. The experiment will take no more than 1 hour to complete. The aim of the experiment is to find answers to the following question:

1. What is the effect of programming expertise on code review task outcomes?

The experiment includes 5 tasks on Javadoc-related defects, Comments-related defects, Header comments-related defects, Identifier name quality-related defects, and class cohesion-related defects. Several of these questions also include a training question that the participant can use to familiarize themselves with the task. Copies of the demographics questionnaire, experiment tasks, and materials are attached to this application. The researcher will be available throughout the session for instruction clarifications, to provide answers for the training questions, and remind the participant to think aloud. The participant's screen and voice will be recorded for further analysis. The recording may include the participant's face given that the participant has uploaded a photo of him or her on Zoom. However, the recordings and experiment data will be available only to the project researchers. The time that the participant spends on each question will also be measured.

The raw data of the experiment will only be available to the researchers. However, if the participant wishes to receive a summary of the final results, the participant can acknowledge the researchers. The experiment data will be de-identified before the analysis. This information will not be linked to the participant's data in any way. We will ensure that the participants will not be able to be identified in any way in any publications resulting from this research.

The members of the research team may have their students participating in the experiment as a result of indirect recruitment. Both PISs and the poster include "If you are a student of the researchers we give our assurance that your participation or non-participation in this study will have no effect on your grades or relationship with the University and that you may contact your academic head should you feel that this assurance has not been met. " statement.

2.4.a. Attach a flowchart or study protocol for complex multi-phase studies.

Documents

Type	Document Name	File Name	Version Date	Version	Size
Default	Flowchart	Flowchart.pdf			54.4 KB

2.5. Data collection period (months):*

The start date is when the proposal is approved. The duration of the project is an estimate of how long you expect data collection will take

6 months

2.6. Provide a summary of the main ethical aspects of the study and give a brief explanation of how these will be addressed or managed:*

Refer to the information icon for a list of common aspects of research involving human participants that could be included in your response.

Anonymity
This experiment is not anonymous because the researcher will be present during the experiment. The researcher will be working with the participants via zoom. The identity of the participant will only be known to the researcher. This is acknowledged in the PIS and the consent form by stating that anonymity cannot be guaranteed.

Confidentiality
The data will be de-identified by the researcher before analysis and reporting. The researcher will not report any information that will help to identify the participant. Thus, the confidentiality of the participant is guaranteed and this is mentioned in the PIS.

Informed Consent
The participant will be provided a PIS with the details of the experiment and its ethical concerns. The participant will have a week to read the PIS and provide his or her consent by signing the consent form we provide.

Privacy
This experiment does not collect any data that can be used to identify the participant. The experiment data will be stored on a secure server at the University of Auckland and will be accessed only by the project researchers. The consent form will be retained by the researcher and stored (separate from the research data) on a secure server at the University of Auckland under the control of the PI for a period of at least 6 years. All, of this information together with the research details are clearly communicated to the participant via the PIS.

Rights of withdrawal
Participants may withdraw at any point in the experiment without giving a reason. The participant's data can be removed within a week from the participation in the experiment without giving a reason. This is communicated to participants via PIS.

Risk of Harm
The tasks and questions involved in the experiment may drive the participants to be insecure about their expertise and ability (i.e. mental harm). To prevent this, the researcher will clearly communicate to the participants that it is the process that is being evaluated and not the participants' expertise and abilities.

Review and editing of electronic recordings and transcripts
The experiment will be conducted via zoom. The screen and the voice of the participant will be recorded for further analysis. This will be clearly stated in the PIS. The transcript of the video will be created by the researcher and shared with the participant within a week after the experiment is conducted. The participant will have 2 weeks to review the transcription for accuracy. The time that the participant will spend on each question will also be measured. This will also be clearly stated in the PIS.

Ownership and storage of recordings
The researchers will own the voice and screen recordings. They will be transcribed before analysis and report. The recordings will be stored on a secure server at the University of Auckland under the control of the project researchers for a period of at least 6 years. This is stated in the PIS.

Recruitment
The participants will be recruited indirectly by advertising a physical poster, mailing in group email threads, posting on social media, and online forums. Also, snowballing will be used for recruitment where current participants may invite other potential participants they know.

Information for participants
Information for participants will be provided via a detailed PIS containing all essential information recommended by the ethics committee.

Voluntary participation
Participation in this experiment is completely voluntary and this is communicated to the participant through PIS.

Compensation for Participation
A participant will be given a 50 NZD gift card for their time and effort. The gift card will be posted to the participant within 1 week of the experiment.

2.7. How is the intended research consistent with Te Tiriti o Waitangi?*

This research is of interest to any professional who is involved with the code review process or willing to contribute to the code review process. This includes Māori professionals as well. Those who are involved with the code review process (Programming-experts) already will get to reduce the workload imposed on them due to code review making the code review process cheaper. Other professionals get an opportunity to contribute to code review which will enable many new job opportunities for anyone other than the programmers. This research consults the Māori members of the ethics committee to make sure that respect for their cultural knowledge and traditions, including Māori individual and collective rights, Māori data, Māori culture, cultural concepts values, norms, practices, and language is achieved by the research (Partnership). Since we are accepting any professional aged 18 or more, Māori participants are given an equal opportunity to participate in the research (Participation). Since this experiment is completely voluntary and does not involve any Māori cultural aspects, protection is also provided by default. Thus, the intended research is consistent with the Treaty of Waitangi.

Section 3 : Location(s) where research will take place
Tekihana 3 : Te(Ngā) wāhi kei reira nei te rangahau

3.1. Where will the research take place?*

The experiment will take place online via zoom. Thus, the researcher and the participant may be at a location of their choice.

3.2. Will permission be required to conduct the study at the specific location(s)?*

○ Yes ◉ No

3.3. Will the research be conducted in your own place of work?*

Select 'No' if the research will take place at the University of Auckland

○ Yes ◉ No

3.4. How many departments/organisations (within or outside of the University of Auckland) will participate in your project?*

Include only organisations/Departments from which participants will be recruited.

None.

3.5. Will the researcher be travelling overseas to conduct this research?*

If the study is going to be carried out by using methods such as video conferencing (Zoom), Skype, Google Talk (in which the participants are overseas), then the study is NOT considered an overseas study

○ Yes ◉ No

3.6. Is this application related to one or more previous applications reviewed by an ethics committee?*

○ Yes ◉ No

3.7. Has an application for this study (or a substantially similar study) previously been declined by an ethics committee in New Zealand or overseas?*

○ Yes ◉ No

Section 4 : Māori-focused consultation and engagement
Tekihana 4 : Arotahinga uiuinga tahi ā Māori

4.1. Describe the research team's track-record in Māori-focused research:*

My research does not involve cultural components, i.e., no indigenous people will be participating to portray their cultural perspectives or traditional knowledge as part of the data gathering.

4.2. In what ways have you engaged with Māori organisations or communities in the planning stages of the research?*

- ☑ No consultation or engagement
- ☐ Some consultation or engagement
- ☐ Significant consultation or engagement

4.2.a. Explain why consultation or engagement with Māori organisations or communities was not undertaken:*

My research does not involve cultural components, i.e., no indigenous people will be participating to portray their cultural perspectives or traditional knowledge as part of the data gathering. So, there was no need to consult or engage Māori organizations or communities. However, we engage the Māori members of the ethics committee to verify that our research is consistent with the Treaty of Waitangi.

Section 5 : Study Methodology
Tekihana 5 : Tikanga akoranga

5.1. Provide a summary of what participants will have to do when taking part in the study:*

Once the invitation is received, the participants who are willing to take part in the experiment will email the researcher with the answer to the question "Do you have programming knowledge or experience?". Then the participants who emailed will be sent the PIS and the consent form of the experiment. The participant will then return the signed consent form and his or her availability details.

The researcher will then schedule a zoom meeting with the participant to conduct the experiment.

During the experiment, the participant will have to complete a series of tasks that are essentially derived from code review. The tasks are to detect several types of code defects. The materials that the participant has to use to perform the tasks vary based on the type of participant:
1. Programmers: will receive a set of source code to review.
2. Non-programmers: will receive a modified version of the source code to review.

Prior to each of these tasks, the instructions will be provided in terms of a text description, a video description, or both, appropriately. The researcher will be available to provide any clarifications regarding the instructions of the experiment. Before attending to the actual task, the participant has to complete a training question that is aimed at training the participant for the task at hand. For the training questions, once completed by the participant, the answers will be discussed by the researcher. While performing the actual task, the participant has to think aloud (express his or her thoughts as they occur) about their answer decisions. The researcher may remind the participant to think aloud from time to time if required. The screen and the voice of the participant will be recorded to later create the transcript for further analysis. Also, the time the participant spends on each question also will be measured.

5.2. Select the relevant study methodology(ies):*

- ☐ Interviews
- ☐ Focus groups
- ☑ Survey(s) or questionnaire(s)
- ☐ Observations
- ☐ Audits and Data Analysis
- ☐ Secondary Data Analysis
- ☐ Photography/Film/Video (Do NOT tick this if you are using video to record an interview or focus group. See Applicants' Reference Manual Section 5.4.7.
- ☐ Virtual/Augmented Reality (VR/AR)
- ☑ Other

5.2.c. Attach the questionnaire(s).*

Documents

Type	Document Name	File Name	Version Date	Version	Size
Surveys or questionnaires	Programmer_Survey	Programmer_Survey.pdf			1.2 MB
Surveys or questionnaires	NonProgrammer_Survey	NonProgrammer_Survey.pdf			500.9 KB

5.2.f. Provide more information about any other methodologies that will be used:*

The thinking aloud protocol will be used to investigate participants' thinking process while performing the tasks. The participant is expected to think aloud (express his or her thoughts as they occur) about the decisions and challenges they come across while performing the tasks.

5.3. Is this an intervention study?*

◉ Yes ○ No

5.3.a. Provide more information:*

This experiment makes use of original source code or modified versions of source code based on the participant type (programmer vs. non-programmer) to study whether non-expert-programmers can contribute to code review as accurately as programming experts. The non-programmers will be given the modified source code because they are unable to read and understand code. Also, the survey includes Training Questions which are used to familiarize the participant with the process under experimentation. The researcher will provide the answers and explanations of the training questions once the participant completes them to ensure what the participant is supposed to do.

Section 6 : Anonymity, Coding and de-identification of data
Tekihana 6 : Muna, Tohu Muna me te āraingararaunga

6.1. Will the survey(s) or questionnaire(s) be anonymous?*

○ Yes ◉ No

6.2. Will the questionnaire be web-based? *

◉ Yes ○ No

6.2.a. Provide information about the platform that will be used for the web-based questionnaire:*

Qualtrics will be used: https://www.qualtrics.com/au/?rid=ip&prevsite=en&newsite=au&geo=NZ&geomatch=au

Ensure this is added to the PIS.

6.3. Will the data be provided to you in identifiable format?*

◉ Yes ○ No

6.3.a. Will permission be required to access the identifiable data?*

○ Yes ◉ No

6.4. Will participant responses or data be coded or de-identified?*

(•) Yes ( ) No

6.4.a. Explain who will code or de-identify the data and when this will occur.*

Explain in the PIS how confidentiality of participants' identities will be preserved.

During the experiment, the researcher will know the participant. However, the data will be de-identified once the experiment is completed by the participant.

6.4.b. Explain the coding process, who will keep the list of codes and who will have access to the list during and after data collection.*

Also explain the coding procedure in the PIS.

Each participant will be assigned a unique code against which the response data will be stored. The participant's name and email will also be stored against the same unique code but separate from the experiment data. This is needed to remove the participant's data if he or she decides to withdraw. Access to the list of codes will be available only to the researchers throughout the research.

6.5. Will the identifiers be used for future re-identification of individuals?*

( ) Yes (•) No

6.6. Will information about participants be obtained from third parties (i.e. anyone other than the participant themselves)?*

( ) Yes (•) No

6.7. Will any identifiable information about the participants be given to third parties (i.e. to anyone other than the researchers)?*

( ) Yes (•) No

6.8. Does the research involve evaluation of the University of Auckland services, staff and students or organisational practices where information of a personal nature may be collected and where participants may be identified?*

( ) Yes (•) No

6.9. Does the research study require participants to comment on their employers?*

( ) Yes (•) No

6.10. Does the research involve matters of commercial sensitivity? *

( ) Yes (•) No

6.11. Does the research involve deception of the participants?*

○ Yes ◉ No

6.12. Has the study design been influenced by an organisation outside the University of Auckland?*

○ Yes ◉ No

6.13. Are you intending to conduct the study in class time?*

○ Yes ◉ No

6.14. Will participants receive any payments, reimbursement of expenses or any similar benefits for taking part in the study?*

◉ Yes ○ No

6.14.a. Describe these and explain why they are appropriate:*
Ensure this information is added to the PIS.

A 50 NZD gift card will be provided to the participant for his or her time. Since we are expecting professional participants, we have to maintain an hourly rate that matches the general hourly rate of a professional. The compensation will be applied to all participants, irrespective of whether they withdraw during the project. The participant will also have an opportunity to decline payment or seek recompense in an equivalent or culturally appropriate manner, such as a koha payment to an iwi. The participant will be referred to the Inland Revenue website page on amounts received by volunteers to enable the participants to determine their own tax treatment.

6.15. Will participants be entered into a prize draw?*

○ Yes ◉ No

6.16. Will participants be recognised in kind, e.g., koha?*

○ Yes ◉ No

Section 7 : Participants
Tekihana 7 : Te hunga whaipānga

7.1. Select the participants in this study:*

- [x] Adults
- [x] Colleagues of researcher(s)
- [x] Students
- [ ] Persons aged less than 16 years old

7.1.a. State the age(s) or age group(s) of adult participants*

18 years or older

7.1.b. Is it possible that the researcher's own students could be included as participants?
Ensure that the appropriate assurance statement is added to the PIS (Refer to the the Information icon and also the Applicants' Reference Manual, section 5.4.11)

(•) Yes ( ) No

Vulnerable Participants

7.3. Will the study include persons whose capacity to give informed consent (other than children) is compromised or have difficulty giving informed consent?*

( ) Yes (•) No

7.4. Persons who are in a dependent situation, such as people with a disability, residents of a hospital, nursing home or prison*

( ) Yes (•) No

7.5. Will the study include other vulnerable groups, such as older persons, persons who have suffered abuse, persons who are not competent in English, or new immigrants?*

( ) Yes (•) No

7.6. Does the research involve processes that are potentially disadvantageous to a person or group (for example, the collection of information which may expose the person/group to discrimination)? *

( ) Yes (•) No

7.7. If a questionnaire is used, will participants have difficulty completing the questionnaire on their own behalf?*
Consider physical or mental condition, age, language, legal status, or other barriers.

( ) Yes (•) No

7.8. State how many participants you intend to recruit for each participant group?*

Programmers - 50 participants, Non-programmers - 50 participants.

Inclusion and exclusion criteria

7.9. What are the participant inclusion criteria for the study?*

Any person 18 years or above of age will be considered.

7.10. What are the participant exclusion criteria for the study?*

Any person below 18 years of age will be excluded.

7.11. Are there any potential participants who fit the inclusion criteria and may express interest in taking part, but could be excluded from participating?*

(•) Yes ( ) No

7.11.a. Attach the email script/wording you plan to use in declining their participation.*

Documents

Type	Document Name	File Name	Version Date	Version	Size
Default	Decline_Email	Decline_Email.pdf			54.6 KB

7.13. How will Māori participate in this research project?*

- [ ] Māori governance group
- [ ] Lead investigators
- [ ] Co-investigators
- [ ] Research assistants
- [x] As participants
- [ ] Co-ordinators
- [ ] Expert advisors
- [ ] Other

7.13.a. Explain:*

We are targeting the population aged 18 or more. Thus, our experiment sample may include Māori participants.

7.14. How will you ensure that the participants' whānau will be involved in the study?*

The participants' whānau can be present near him or her if the participant requires support during the study. Also, the participants' whānau members may participate in the experiment as well

7.15. Will participants be able to undertake the study in te reo Māori if desired?*

○ Yes ◉ No

7.15.a. Explain:*

Since the most commonly used ethnic language in programming is English, the questions will be provided in English.

7.16. Will the appropriate tikanga Māori protocols be carried out when required?*
For example, pōwhiri

○ Yes ◉ No

7.16.a. Explain:*

The study does not involve any Māori cultural aspects and thus not require any Māori protocols.

7.17. Describe any other provisions you have made in your study to ensure the cultural preferences of Māori have been considered:*
Ensure that contact details for cultural support are provide in the PIS

All participants will be treated the same during the experiment. Since our study does not involve any Māori cultural aspects, no special provisions are required.

7.17.a. Attach copies of any support documents with this application.

Participants- Other Groups

7.18. Will any other population groups be specifically targeted for inclusion in the study*?*

○ Yes ◉ No

Section 8 : Information, Recruitment & Consent
Tekihana 8 : Pārongo, Kimi Tangata me te Whakaaetanga

8.1. Provide details of how participants will be recruited for this study.*

This study is an experiment conducted via online communication tools such as zoom. The potential participant for this survey is any person aged 18 years or more. They will be invited through personal networks such as email lists, LinkedIn, Twitter and Facebook, online software communities such as Stack Overflow and GitHub, and by advertising a poster. Also, we are expecting to distribute the survey through snowballing i.e. research participants will be asked to further distribute the invitation to their contacts. As a result of these methods we use to recruit, the recruitment will be indirect. Those who are directly contacted by the researchers will be informed that their participation is not expected, but is welcome.

8.2. Provide details of the strategies that will be used to ensure culturally appropriate recruitment of Māori:*

My research will not involve cultural components, i.e., no indigenous people will be participating to portray their cultural perspectives or traditional knowledge as part of the data gathering.

8.3. Explain the process by which potential participants will be provided with information about the study, an opportunity to ask questions, and be asked to give their informed consent :*

The participants will receive the experiment information such as what the experiment is about and what is expected from them on the PIS, the consent form, and the invitation. The pre-requisite knowledge and instructions of the experiment will be provided through video descriptions and text descriptions during the experiment. The tasks will also include a training question to help the participants to familiarize themselves with the task before trying out the actual questions. The researcher will be available throughout the experiment to provide clarifications on the instructions, provide the answers to the training questions, and to remind the participant to think aloud. The informed consent will be requested in the demographics questionnaire that will be distributed along with the invitation to participate. The participants who are willing to participate can do so by providing consent by signing the consent form and completing the demographics survey.

8.4. Who will make the initial approach to potential participants?*

- [x] Researcher
- [ ] Other
- [ ] Researcher and/or Other

8.5. Will consent/permission of any organisation be required to access potential participants or their data?*

- ( ) Yes
- (•) No

8.6. Is there any special relationship between the participants and the researchers? *

- ( ) Yes
- (•) No

8.7. Obtaining consent from participants:*

8.7.i. ☑ The study includes consenting participants only

8.7.ii. ☐ The study includes non-consenting participants only

8.7.iii. ☐ The study includes both consenting and non-consenting participants

8.7.b. Will participants give consent in writing by signing a paper consent form? *

◉ Yes ○ No

8.7.b.i. Will participants give consent by submitting an anonymous questionnaire?*
Ensure that participants are told on their PIS that submission of the questionnaire will be taken as consent to participate.

○ Yes ◉ No

8.7.b.ii. Will participants give consent by ticking an electronic checkbox? *

○ Yes ◉ No

8.7.b.iii. Will participants give consent by submitting an electronic consent form?*

◉ Yes ○ No

Explain the consent process and how a record of the consent will be kept*

For the experiment, the electronic form will be sent to the potential participants who may sign it electronically or physically to provide their consent to participate in the survey. The form will be retained in secure storage separately from the experiment data by the primary investigator for a period of six years or while the experiment data is retained.

8.7.b.iv. Will participants give oral consent?*

○ Yes ◉ No

8.7.b.v. Will any other methods be used to obtain consent?*

○ Yes ◉ No

8.8. Does the research use previously collected information for which there was no explicit consent?*

○ Yes ◉ No

8.9. Will access to the Consent Forms be restricted to the Principal Investigator and/or the researchers?*

- (•) Yes
- ( ) No
- ( ) Not applicable

Indicate this on the PIS

8.10. Will Consent Forms be stored by the Principal Investigator in a secure manner, separate from the research data?*
In general, the CFs should be stored securely on University of Auckland premises, e.g., in a locked cabinet, or if scanned/electronic, on a University-managed storage system. Consent Forms should be stored separately from the research data.

(•) Yes ( ) No

Explain this in the PIS

8.11. How long will the consent forms be stored?*
Explain and justify proposed time and indicate this on the PIS. If Consent Forms will not be used, reply "Not applicable'.

The consent forms will be retained for 6 years or while the experiment data is retained, separate from the experiment data.

8.12. Will you be using invitation or advertisements during the recruitment process?*

(•) Yes ( ) No

8.12.a. Attach*

Documents

Type	Document Name	File Name	Version Date	Version	Size
Default	Poster	Poster.pdf			858.6 KB
Default	Invitation_Email	Invitation_Email.pdf			67.4 KB

8.13. Will you be using Participant Information Sheet(s) or Consent Form(s) during the consent process?*

(•) Yes ( ) No

8.13.a. Attach*

Documents

Type	Document Name	File Name	Version Date	Version	Size
Default	ConsentForm	ConsentForm.pdf			133.3 KB
Default	PIS_Non_Programmer_Experiment	PIS_Non_Programmer_Experiment.pdf			129.5 KB
Default	PIS_Programmer_Experiment	PIS_Programmer_Experiment.pdf			128.8 KB

8.14. Will public documents be translated once ethics approval has been obtained?*

○ Yes ◉ No

8.15. Are you planning to disseminate (a summary of) the study results to participants?*

◉ Yes ○ No

8.15.a. Detail how (a summary of) the study results will be disseminated to participants:*

- ☑ Final report sent to participants
- ☑ Summary of results provided to participants
- ☐ Hui held with participants and whānau
- ☐ Other

Ensure that you add a space on the Consent form to collect an email or postal address on the consent form.

8.15.b. Detail how study results will be disseminated to Māori participants and whānau, as well as to key Māori stakeholders:*

- ☐ Pānui/progress reports sent to participants or whānau
- ☐ Pānui/progress reports sent to Māori governance groups, expert advisors (tikanga research), lead and co-investigators, co-cordinators and research assistants
- ☑ Summary of results provided to participants and or whānau
- ☐ Hui held with participants and whānau
- ☐ Other

8.16. In which of the following forms will the results from the study be published or otherwise disseminated?*

- ☑ Journal publication
- ☑ Conference presentation
- ☑ Thesis/dissertation
- ☐ Other publications
- ☐ Hui
- ☐ Public meetings
- ☐ Other

Section 9 : Risk and Benefits
Tekihana 9 : Ngā tūraru me ngā huanga

9.1. Describe any direct benefits the study may have for participants:*

As explained in research aims/objectives, the information collected from the participants is to be used to identify whether non-programming-experts can contribute to code review. If non-programming-experts display capabilities of contributing to code review, we may be able to design a new code review process with reduced cost. The programmer community will benefit from the reduced code review cost. The non-programmer community will benefit from the new employment opportunities created by the new code review process.

9.2. Describe any wider/other benefits of the study:*

The reduction of code review costs will reduce the overall software development cost. As a result, the software cost that the software users have to bear would be lowered as well.

9.3. How does this research impact/benefit Māori?*

Describe how this research project can contribute to addressing inequities faced by Māori participants and their whānau, for example, the steps you have taken to ensure your public documents are appropriate for Māori

My research does not involve cultural components, i.e., no indigenous people will be participating to portray their cultural perspectives or traditional knowledge as part of the data gathering.

9.4. Is the research likely to cause any harm to the participants, such as physical pain beyond mild discomfort, embarrassment, psychological or spiritual harm?*

○ Yes ◉ No

9.5. Is it possible the research will involve any risk of harm to the researchers?*

○ Yes ◉ No

9.6. Does the research involve collection of information about illegal behaviour(s) which could place the research or participants at risk of criminal or civil liability or be damaging to their financial standing, employability, professional or personal relationships?*

○ Yes ◉ No

9.7. Is it possible that the research could give rise to incidental findings?*

○ Yes ◉ No

9.8. Describe what provisions are in place for the research participants should there be adverse consequences or physical or psychological risks.*

This experiment does not involve any physical risks because the participant is not present in person. A psychological risk that could occur in this experiment is, participant feeling insecure about their knowledge and abilities. To mitigate this risk, the participant will be thoroughly informed that it is the code review process that is being evaluated, and not their knowledge or abilities. Additionally, the participant will be directed to the University of Auckland Counselling services if required.

9.9 Have the cultural risks of the study been fully explained?*

- ○ Yes
- ○ No
- ◉ Not applicable (not part of this study)

9.10. Does the research involve a conflict of interest or the appearance of a conflict of interest for the PI or the research team in relation to the research participants?*

Click on information icon for examples.

○ Yes ◉ No

Section 10 : Data Management
Tekihana 10 : Whakahaerenga raraunga

Data Storage:

10.1. Explain how data will be stored during and after data collection:*

Electronic data will be backed up and stored on the University of Auckland server.

10.2. For how long will the data generated in this study be stored?*

(including audio-recordings, video-recordings, digital voice recordings, and electronic data)

Data collected will be stored electronically for an indefinite duration of time.

10.3. In what form will data from the study be stored after the study has finished?*

☐ Identified	☐ Potentially identifiable	☐ Partially de-identified
☑ De-identified	☐ Anonymous	☐ Other

10.4. Explain how data will be deleted or destroyed:*

If the data is no longer useful after six years, then it will be destroyed by deleting the digital files.

10.5. Will the results of your study be published in a form that identifies (or could reasonably be expected to identify) individual participants?*

○ Yes ◉ No

10.6. Will the participants be audio-recorded, video-recorded or recorded by any other means? *

(•) Yes ( ) No

10.6.a. Provide more details and explain if participants will be identifiable from video recordings (if used):*

The screen and the voice of the participants will be recorded while performing the experiment tasks, for further analysis. The participant may be identified from the voice recording. Thus, the consent form includes the statement "I give my permission for my screen and my voice to be recorded while I'm participating in the experiment. I also provide my permission to record the time I spend on each task. I have been assured that all the information will be kept private and confidential, and only be used for the use of this research study. ".

10.7. Will the recordings be transcribed?*

(•) Yes ( ) No

10.7.a. Explain who will transcribe the recordings:*

The student researcher Ms.Sanuri Gunawardena will transcribe the recordings with the help of a transcription tool such as Microsoft Word's "speech to text" feature.

10.8. Will participants be offered the opportunity to edit the transcript of the recording?*

(•) Yes ( ) No

10.8.a. Explain the process of providing the transcript and period allowed for editing:*

The participants will receive the transcription within a week from the experiment on the email address they have provided in the demographics survey. Each participant will have 2 weeks for editing.

10.9. Will the transcription be translated?*

( ) Yes (•) No

10.10. Will participants be offered their recordings or digital files of their recording (or a copy thereof)?*

( ) Yes (•) No

10.11. If any of the research procedures will be carried out by a third party other than the named researchers or co-investigators, attach a copy of the confidentiality agreement (unsigned) that will be used.

Section 11 : Funding
Tekihana 11 : Pūtea Moni

11.1. Will you receive funding for this project?*

○ Yes ◉ No

Section 12 : Attach other documents (including memos)

Upload a memo of response to conditionally approved or pending applications

Upload any other study-related documents

This section should not be used to attach updated recruitment documents, PISs or CFs that were previously attached to the application form. When a previously provided document needs to be updated, delete it from the particular question and replace it with an updated version. The previous version(s) of such amended documents will still be available. Hint: use the version number facility to distinguish between different updated documents.

This section should be used to provide additional study-related documents (not requested as part of the form) to aid the Committee's understanding of the study. However, please do not attach any journal articles here – a summary of the relevance of publications can be added in the questions of Section 2 describing the study.

		Documents			
Type	**Document Name**	**File Name**	**Version Date**	**Version**	**Size**
Miscellaneous Documents	ProgrammerCodeMaterialsForCodeReview	ProgrammerCodeMaterialsForCodeReview.rar			25.1 KB
Miscellaneous Documents	VideoLinks	VideoLinks.pdf			97.3 KB
Miscellaneous Documents	Memo	Memo.pdf			103.6 KB

Section 12 : Feedback/Comments

Feedback/Comments

If you wish to provide feedback on the experience of completing this online form, please do so here.

Please do not use this section to make any comments related to the study itself.

The same information is asked in several questions. Please make this application more concise and less repetitive.

Section 13 : Submission and Sign off

Application type

Please select one of the following:*

- ○ INITIAL APPLICATION – default application type for initial applications. Do not change the application type if outstanding signatures are still required. All sign-offs will have to be obtained again if the application is re-submitted with this application type.
- ○ RESPONSE TO PRE-SCREEN – when you have made changes to the application in response to pre-screening and all sign-off were previously obtained (this option will bypass obtaining sign-off again).
- ◉ CONDITIONAL APPROVAL – your re-submission is a response to a conditional approval outcome.
- ○ PENDING RESUBMISSION – your re-submission is a response to a pending resubmission outcome.
- ○ EMPOWERED – your re-submission is a response to changes required following discussions with Committee members empowered to approve the application.
- ○ AMENDMENT REQUEST – you want to make changes to a previously approved application or request an extension of the approval period.

Are you a student?*
(Doctoral, Masters or Honours or undergrad/summer student)

○ Yes ◉ No

13.2. To submit the application, please click "Sign" *
Sign-Off must be done by the Principal Investigator or Supervisor only.

Signed: This form was signed by Assoc Prof Ewan Tempero (e.tempero@auckland.ac.nz) on 18/11/2020 3:36 PM

Summary and Questions for the Committee

Please add Summary and Questions for the Committee here

Review Recommendation

Please add Review Recommendation here

Documents migrated from InfoEd

InfoEd attachment