Table 1. Soil-2018 replication specification using the template

Field	Value
Replication	***Soil-2018*** Internal replication based on ***Soil-2016*** original experiment
Description of experiment	To evaluate the effect of a bio-surfactant on the assisted phytoremediation of contaminated soil
Site and Date	The base experiment was carried out in *ETSIA-University of Seville* in *October 2015* and this replication, in *ETSIA-University of Seville* in *March 2018*
Purpose	Extend results
Change *1*	**Originally**, the experiment was carried out in a cultivation chamber. **In replication**, was carried out in a greenhouse **In order to** simulate natural conditions
Modified Dimension	**Population**, specifically experimental objects
Threat to validity	The change increases the external validity since it allows to generalize the results carrying out the replication in conditions closer to the natural ones
Change *2*	**Originally**, two types of plants were used: *Hordeum vulgare* L. and *Brassica juncea* L. **In replication**, only *Brassica juncea* L. was used **Because** in the original experiment it was demonstrated that only *Brassica juncea* L. was a metal accumulator plant
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change does not affect validity
Change *3*	**Originally**, there were two types of soil: Coria (pH=7.8) and Constantina (pH=5.5) **In replication**, only Constantina soil was used **Because** it was demonstrated that in the soil of Coria the metal was strongly adsorbed and the phytoextraction did not affect the biomass production
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change does not affect validity
Change *4*	**Originally**, Copper (Cu) doses were 0, 500 and 1000 mg kg^{-1} **In replication**, Cu doses were adjusted to 0, 125, 250 and 500 mg kg^{-1} **Because of** Cu doses of 1000 mg kg^{-1} was toxic to the plant
Modified Dimension	**Operationalization**, specifically independent variable dosisCu
Threat to validity	The change increases internal validity because the Cu dose is adjusted to non-toxic levels for the plant
Change *5*	**Originally**, Cu was applied as Copper Nitrate **In replication**, Cu was applied as Copper Sulfate **Because of** is more accessible and the concentrations applied do not affect the plant
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change does not affect validity

Field	Value
Change *6*	**Originally**, the soil aging time (from the time Cu is applied until the plant is sown) is 45 days **In replication**, soil aging time is 15 days **Because of** time constraints and so that Cu is not so much retained
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change does not affect validity
Change *7*	**Originally**, there were 6 treatments corresponding to the 3 levels of Cu and with/without *surfactant* (to facilitate Cu extraction). There were 2 soils and 2 types of plants. This represents 24 experimental units (3x2x2x2). For each experimental unit, 3 pots were prepared. In total there are 72 pots (3x2x2x2x3) **In replication**, there were 8 treatments corresponding to 4 level of Cu and with/without *surfactant*. There were 1 soil and 1 type of plant. This represents 8 experimental units. For each experimental unit, 4 pots were prepared and placed on a tray. In total there were 32 pots (4x2x4) distributed in 8 trays with 4 pots each. The trays are distributed completely randomly. This is repeated 3 times. The experimental unit was the tray **Because** by cultivating 4 pots in each tray sufficient biomass can be obtained
Modified Dimension	**Protocol**, specifically experimental design
Threat to validity	The change increases internal validity because more biomass is obtained for further analysis
Change *8*	**Originally**, the biomass is collected when the plants have between 2 and 3 true leaves **In replication**, the plants are rinsed when they have between 2 and 3 real leaves and 4 plants are left by pot. The biomass is collected when the plants reach the fructification stage **In order to** avoid competition between plants, let the plants complete their vegetative cycle and thus obtain more biomass
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases internal validity due to more biomass being obtained for further analysis
Change *9*	**Originally**, the pots are 300 ml tube type **In replication**, the pots are 500 ml bucket type. **Because** a greater volume of soil allows for greater root development and greater biomass production
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change increases internal validity due to more biomass being obtained for further analysis

Table 2. Soil-2019 replication specification using the template

Field	Value
Replication	***Soil-2019*** Internal replication based on ***Soil-2016*** original experiment
Description of experiment	To evaluate the effect of a bio-surfactant on the assisted phytoremediation of contaminated soil
Site and Date	The base experiment was carried out in *ETSIA-University of Seville* in *October 2015* and this replication, in *ETSIA-University of Seville* in *March 2019*
Purpose	Extend results
Change *1*	**Originally**, the experiment was carried out in a cultivation chamber **In replication**, was carried out in a greenhouse **In order to** simulate natural conditions
Modified Dimension	**Population**, specifically experimental objects
Threat to validity	The change increases the external validity since it allows to generalize the results performing the replication in conditions closer to the natural ones
Change *2*	**Originally**, two types of plants were used: *Hordeum vulgare* L. and *Brassica juncea* L. **In replication**, only *Brassica juncea* L. was used **Because** in the original experiment it was demonstrated that only *Brassica juncea* L. was a metal accumulator plant
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change does not affect validity
Change *3*	**Originally**, there were two types of soil: Coria (pH=7.8) and Constantina (pH=5.5) **In replication**, there were three types of soil: Miraflores-1 (pH=x, Pb=158 y Zn=125, Cu=36) and Miraflores-2 (pH=y, Pb=375 Zn=192 Cu=206) and Lebrija (not contaminated by metals) **In order to** experiment with naturally contaminated soils. Miraflores soils are urban gardens with natural contamination and Lebrija soil was used as control
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change increase external validity since it allows to generalize the results in natural soils
Change *4*	**Originally**, Copper (Cu) doses were 0, 500 and 1000 mg kg^{-1} applied as Copper Nitrate **In replication**, the soils are not artificially contaminated with Cu **Because of** these soils are urban orchard-gardens with natural pollution (Cu levels 36 and 206 mg kg^{-1})
Modified Dimension	**Operationalization**, specifically independent variable dosisCu
Threat to validity	The change increase external validity since it allows to generalize the results in natural soils

Field	Value
Change *5*	**Originally**, there were 6 treatments corresponding to the 3 levels of Cu and with/without *surfactant* (to facilitate Cu extraction). There were 2 soils and 2 types of plants. This represents 24 experimental units (3x2x2x2). For each experimental unit, 3 pots were prepared. In total there are 72 pots (3x2x2x2x3) **In replication**, there were 2 treatments corresponding to with/without *surfactant*. There were 3 soils and 1 type of plant. This represents 6 experimental units. Each experimental unit was repeated 4 times (2x3x4 pots) forming a block. This is repeated 3 times to have 3 blocks. In total there are 72 pots (2x3x4x3). Within each block, pots are randomly distributed. The experimental unit is the pot. **Because of**
Modified Dimension	**Protocol**, specifically experimental design
Threat to validity	The change does not affect validity
Change *6*	**Originally**, the biomass is collected when the plants have between 2 and 3 true leaves **In replication**, the plants are rinsed when they have between 2 and 3 real leaves and only 1 plant is left by pot. The biomass is collected when the plants reach the fructification stage. **In order to** avoid competition between plants, let the plants complete their vegetative cycle and thus obtain more biomass
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases internal validity due to more biomass being obtained for further analysis
Change *7*	**Originally**, the pots are 300 ml tube type **In replication**, the pots are 500 ml bucket type. **Because** a greater volume of soil allows for greater root development and greater biomass production
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change increases internal validity due to more biomass being obtained for further analysis

Table 3. VOO-2017V replication specification using the template

Field	Value
Replication	***VOO-2017V*** Internal replication based on ***VOO-2016A*** original experiment
Description of experiment	To evaluate the effect of the olive variety on the quality of the virgin olive oil (VOO) obtained
Site and Date	The base experiment was carried out in *Instituto de la Grasa (CSIC) Sevilla* in *October 2016* and this replication, in *Instituto de la Grasa (CSIC) Sevilla* in *2017*
Purpose	Extend results
Change *1*	**Originally**, the type of olive was *Arbequina* **In replication**, the type of olive was *Verdial* **In order to** study the difference in quality of oil from different varieties
Change *2*	**Originally**, the weather conditions are those of 2016 **In replication**, the climatic conditions are different as they correspond to 2017 **In order to** analyze data corresponding to different campaigns

Table 4. VOO-2017P replication specification using the template

Field	Value
Replication	***VOO-2017P*** Internal replication based on ***VOO-2016A*** original experiment
Description of experiment	To evaluate the effect of the olive variety on the quality of the virgin olive oil (VOO) obtained
Site and Date	The base experiment was carried out in *Instituto de la Grasa (CSIC) Sevilla* in *October 2016* and this replication, in *Instituto de la Grasa (CSIC) Sevilla* in *2017*
Purpose	Extend results
Change *1*	**Originally**, the type of olive was *Arbequina* **In replication**, the type of olive was *Picual* **In order to** study the difference in quality of oil from different varieties
Change *2*	**Originally**, the weather conditions are those of 2016 **In replication**, the climatic conditions are different as they correspond to 2017 **In order to** analyze data corresponding to different campaigns

Table 5. Olive-Des replication specification using the template

Field	Value
Replication	***Olive-Des*** Internal replication based on ***Olive-2015*** original experiment
Description of experiment	Extraction phenolic compounds (EPC) from virgin olive oil with green solvents (Deep Eutectic Solvents DES)
Site and Date	The base experiment was carried out in *Instituto de la Grasa (CSIC) Sevilla* in *2015* and this replication, in *Instituto de la Grasa (CSIC) Sevilla* in *2015*
Purpose	Extend results
Change *1*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Glycerol (1:2)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *2*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Lactic acid (1:2)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *3*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Urea (1:2)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *4*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Sucrose (1:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *5*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Sucrose (4:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *6*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and 1,4-Butanediol (1:5)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*

Field	Value
Change *7*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Xylitol (2:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *8*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and 1,2-Propanediol (1:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *9*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride and Malonic acid (1:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *10*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *Choline chloride, Urea and Glycerol (1:1:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*
Change *11*	**Originally**, the extraction is done with a solution 80% (v/v) *methanol and water* **In replication**, the extraction is done with a solution *D-(−)-Fructose D-(+)-Glucose and Sucrose (1:1:1)* **In order to** analyze non-toxic alternatives for the extraction of *phenolic compounds*

Table 6. Diet-Hiper replication specification using the template

Field	Value
Replication	***Diet-Hiper*** Internal replication based on ***Diet-Normo*** original experiment
Description of experiment	Effect of meal rich in oleic acid on *hypertriglyceridemic* subjects
Site and Date	The base experiment was carried out in *Instituto de la Grasa (CSIC) Sevilla* in *2006* and this replication, in *Instituto de la Grasa (CSIC) Sevilla* in *2006*
Purpose	Extend results
Change *1*	**Originally**, Subjects have blood pressure levels within the limits considered normal **In replication**, Subjects are *hypertensive* **In order to** study the effect of the diet rich in oleic acid on *hypertriglyceridemic* subjects who are also *hypertensive*

Table 7. SPL–Pr&Com replication specification using the template

Field	Value
Replication	***SPL–Pr&Com*** Internal replication based on ***SPL–Pr*** original experiment
Description of experiment	Comparison of test case prioritization criteria for Software Product Lines (SPL)
Site and Date	The base experiment was carried out in *ETSII-University of Seville* in *2014* and this replication, in *ETSII-University of Seville* in *2014*
Purpose	Extend results
Change *1*	**Originally**, only a test suite was generated **In replication**, for each model, 2-wise test suite was generated **In order to** obtain a list of products covering all the possible pairs of features on each model
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	the change does not affect validity
Change *2*	**Originally**, a test suite was randomly generated using SPLAR tool **In replication**, test suite was randomly generated using SPLCAT tool **Because** SPLCAT increase the fault detection rate and thus it is considered as an extra prioritization approach in our comparison
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	the change does not affect validity because because only the tool used changes

Table 8. Test-NF replication specification using the template

Field	Value
Replication	***Test-NF*** Internal replication based on ***Test-F*** original experiment
Description of experiment	Prioritization of test case execution to accelerate the detection of faults in highly configurable systems
Site and Date	The base experiment was carried out in *ETSII-University of Seville* in *2015* and this replication, in *ETSII-University of Seville* in *2015*
Purpose	Extend results
Change *1*	**Originally**, *objective functions* are *functional* **In replication**, *objective functions* are *non–functional* **In order to** compare differences in favour of multi–objective prioritization over mono–objective prioritization using non–functional objectives
Modified Dimension	**Operationalization**, specifically dependent variable
Threat to validity	The change does not affect validity because dependent variables of the original are replaced by other dependent variables, however the validity is not affected

Table 9. Test–F&NF replication specification using the template

Field	Value
Replication	***Test–F&NF*** Internal replication based on ***Test–F*** original experiment
Description of experiment	Prioritization of test case execution to accelerate the detection of faults in highly configurable systems
Site and Date	The base experiment was carried out in *ETSII-University of Seville* in *2015* and this replication, in *ETSII-University of Seville* in *2015*
Purpose	Extend results
Change *1*	**Originally**, *objective functions* are *functional* **In replication**, *objective functions* combine *functional* and *non–functional* **In order to** analyse whether *multi–objective* prioritization using *functional* and *non–functional* objectives outperform prioritization driven by a single objective, either functional or non–functional
Modified Dimension	**Operationalization**, specifically dependent variable
Threat to validity	The change does not affect validity because dependent variables of the original are replaced by other dependent variables, however the validity is not affected

Table 10. Test–FvsNF replication specification using the template

Field	Value
Replication	***Test–FvsNF*** Internal replication based on ***Test–F*** original experiment
Description of experiment	Prioritization of test case execution to accelerate the detection of faults in highly configurable systems
Site and Date	The base experiment was carried out in *ETSII-University of Seville* in *2015* and this replication, in *ETSII-University of Seville* in *2015*
Purpose	Extend results
Change *1*	**Originally**, *objective functions* are *functional* **In replication**, *objective functions* combine *functional* and *non–functional* **In order to** analyze the domain of *non-functional objectives* over *functional objectives*, especially when these are combined in a *multi-objective* perspective
Modified Dimension	**Operationalization**, specifically dependent variable
Threat to validity	The change does not affect validity because dependent variables of the original are replaced by other dependent variables, however the validity is not affected

Table 11. Instantiation of the proposed template in Mind#2

Field	Value
Mind#2	Replication of experiment *Mind#1*
Type of replication	Internal
Purpose	Confirm results
Change *1*	**Originally**, for 4 weeks Mindfulness was practiced 4 days a week in 10-minute sessions **In replication** In replication the sessions were 12 minutes long and for 6 weeks **in order to** make more evident the benefits of Mindfulness
Modified Dimension	**Operationalization**, specifically the independent variable *Training Workshop*
Threat to validity	The change increases the construct validity
Change *#2*	**Originally**, the assignment of subjects to treatment was not randomized **In replication** it becomes random **in order to** remedy threats to the internal validity of quasi-experiments
Modified Dimension	**Protocol**, specifically experimental design
Threat to validity	The change increases the internal validity
Change *#3*	**Originally**, an public speaking workshop was given to the control group as a placebo **In replication** the oratory workshop took place after the experiment **in order to** avoid a possible effect of such a workshop on the measurements of dependent variables
Modified Dimension	**Operationalization**, specifically the independent variable *Training Workshop*
Threat to validity	The change increases the construct validity

Table 12. Instantiation of the proposed template in Mind#3

Field	Value
Mind#3	Replication of experiment *Mind#2*
Type of replication	Internal
Purpose	Confirm results
Change *1*	**Originally**, students make two exercises of concepual modeling, one before and one after treatment. **In replication** the order of the exercises is swapped **in order to** demonstrate that it does not affect the results
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity

Table 13. Instantiation of the proposed template in Q-2009

Field	Value
Q-2009	Replication of experiment *Q-2007*
Type of replication	Internal
Purpose	Confirm results
Change *1*	**Originally**, analysts' effectiveness in interview sessions is analysed **In replication** effectiveness is not analysed **because of** the high cost of transcribing and analyzing all interviews
Modified Dimension	**Operationalization**, specifically the dependent variable *effectiveness*
Threat to validity	The change ***(***Threat***)
Change *2*	**Originally**, the retention capacity is analyzed **In replication** retention capacity is not analysed **because of** the high cost of transcribing and analyzing all interviews
Modified Dimension	**Operationalization**, specifically the dependent variable *retention capacity*
Threat to validity	The change ***(***Threat***)
Change *3*	**Originally**, no account is taken of development experience **In replication** experience in development is considered to calculate the independent variable experience **because of** ***(***Reason***)
Modified Dimension	**Operationalization**, specifically the dependent variable *development experience*
Threat to validity	The change increases the construct validity
Change *4*	**Originally**, interviews are conducted in Spanish **In replication** interviews are conducted in English **because of** English was a requirement of the master to which the students belonged
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change increases the internal validity
Change *5*	**Originally**, a person responds in interviews **In replication** the person who answers the interviews is changed **because of** ***(***Reason***)
Modified Dimension	**Stakeholder**, specifically the *monitor*
Threat to validity	The change ***(***Threat***)

Table 14. Instantiation of the proposed template in Q-2011

Field	Value
Q-2011	Replication of experiment *Q-2009*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, interviews between subjects (analysts) and experimenter are individual **In replication** interviews are in groups **because of** the cost and effort involved in conducting individual interviews and the experimenter's fatigue
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *2*	**Originally**, experience in requirements analysis is considered **In replication** experience is determined by years of experience and the skill the subject claims to have **because of** ***(***Reason***)
Modified Dimension	**Operationalization**, specifically the independent variable *skill in requirements* and *skill in interviews*
Threat to validity	The change ***(***Threat***)
Change *3*	**Originally**, the duration of the interviews is 30 min. **In replication** the duration of the interviews is 60 min . **because of** the interview is in group
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, The subject (analyst) has 7 days to present in writing the information gathered in the interview. **In replication** the written presentation is immediately after the interview. **in order to** avoid loss of information
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *5*	**Originally**, the time elapsed between the interview and the written presentation of the information collected is not measured **In replication** the time elapsed between the interview and the written presentation of the information is set at 120 min. **because of** the written presentation is immediately after the interview
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *6*	**Originally**, a person responds in interviews **In replication** the person who answers the interviews is changed **because of** ***(***Reason***)
Modified Dimension	**Stakeholder**, specifically the *monitor*
Threat to validity	The change ***(***Threat***)

Table 15. Instantiation of the proposed template in Q-2012

Field	Value
Q-2012	Replication of experiment *Q-2011*
Type of replication	External
Purpose	Confirm results
Change *1*	**Originally**, the subjects are Master's students **In replication** the subjects are professionals **because of** replication is performed at the International Working Conference on Requirements Engineering
Modified Dimension	**Population**, specifically the experimental subjects
Threat to validity	The change increases the external validity
Change *2*	**Originally**, subjects have little or no development experience **In replication** the subjects are professionals with experience in development **because of** replication is performed at the International Working Conference on Requirements Engineering
Modified Dimension	**Operationalization**, specifically the independent variable *development skill*
Threat to validity	The change increases the construct validity
Change *3*	**Originally**, the duration of the interviews is 120 min. **In replication** the duration of the interviews is 30 min . **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, the experiment is carried out at the end of the course, i.e. after the training period **In replication** no training period **because of** replication is performed at the International Working Conference on Requirements Engineering
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity

Table 16. Instantiation of the proposed template in E-2012A

Field	Value
E-2012A	Replication of experiment *Q-2012*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, knowledge is defined as familiarity through subjective assessment **In replication** knowledge is defined as an independent variable with two levels: known and unknown problem **because of** in the experimental population (post-graduate students) it is possible to know whether or not they know a certain domain of the problem
Modified Dimension	**Operationalization**, specifically the independent variable *knowledge*
Threat to validity	The change ***(***Threat***)
Change *2*	**Originally**, the interviews to know the requirements are carried out on two different days, to avoid fatigue in the experimenter **In replication** the design is changed to a design of repeated measurements (within-subjects) **because of** this design does not require a large number of subjects
Modified Dimension	**Protocol**, specifically the experimental design
Threat to validity	The change increases the internal validity
Change *3*	**Originally**, interviews between subjects (analysts) and experimenters are in groups **In replication** interviews are individual
.	**because of** there are two experimenters (responders) with two languages
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, there are no blocking variables **In replication** there is a blocking variable per language **because of** subjects who use their mother tongue will be more effective than subjects who use a second language
Modified Dimension	**Protocol**, specifically the experimental design
Threat to validity	The change increases the internal validity
Change *5*	**Originally**, there are no blocking variables **In replication** there is one blocking variable per experimenter (respondent) **because** experimental subjects conduct the interview in their own language.
Modified Dimension	**Protocol**, specifically the experimental design
Threat to validity	The change increases the internal validity
Change *6*	**Originally**, there is a experimenter (respondent) **In replication** there are two experimenters (respondents) **In order to** alleviate the effects of fatigue and learning of the experimenter (respondents)
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity

Field	Value
Change *7*	**Originally**, there is the same problem (experimental object) for all subjects **In replication** there are two problems **because of** groups are made due to blocking variables
Modified Dimension	**Protocol**, specifically the experimental material
Threat to validity	The change increases the internal validity
Change *8*	**Originally**, the duration of the interviews is 60 min. **In replication** the duration of the interviews is 30 min. **because** the interview is individual
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *9*	**Originally**, the time elapsed between the interview and the written presentation is 30 min. **In replication** the time elapsed between the interview and the written presentation is 90 min. . **because** the recommended duration of 90 minutes
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *10*	**Originally**, the difficulty of the problem is not measured **In replication** the difficulty variable indicates the difficulty of the problem **because** there are two problems
Modified Dimension	**Operationalization**, specifically the independent variable *difficulty*
Threat to validity	The change increases the construct validity

Table 17. Instantiation of the proposed template in E-2012B

Field	Value
E-2012B	Replication of experiment *E-2012A*
Type of replication	Internal
Purpose	Confirm results
Change *1*	**Originally**, two problem domains are used in the experiment, one known domain (DC) and the other unknown domain (DD) **In replication** the problem domains used in the experiment have been modified, but one is still a known domain (DC) and the other is an unknown domain (DD) **because of** ***(***Reason***)
Modified Dimension	**Protocol**, specifically the experimental material
Threat to validity	The change increases the internal validity
Change *2*	**Originally**, first the known domain problem is performed and then the unknown domain problem. **In replication** the order of the problems is swapped **because of** ***(***Reason***)
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *3*	**Originally**, the experiment was carried out at the beginning of the course; **In replication** the experiment is carried out after the subjects have received training in Requirements Engineering **because of** ***(***Reason***)
Modified Dimension	**Operationalization**, ***(***Context***)
Threat to validity	The change increases the construct validity

Table 18. Instantiation of the proposed template in E-2013

Field	Value
E-2013	Replication of experiment *E-2012B*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, the design is of repeated measurements **In replication** the design is between-subjects **In order to** avoid the learning effect
Modified Dimension	**Protocol**, specifically experimental design
Threat to validity	The change increases the internal validity
Change *2*	**Originally**, no short training (warming up) before the course **In replication** the brief training (warming up) is 1 week **Because of** ***(***Reason***)
Modified Dimension	**Operationalization**, ***(***Name***)
Threat to validity	The change increases the construct validity

Table 19. Instantiation of the proposed template in E-2014

Field	Value
E-2014	Replication of experiment *E-2013*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, in the interviews, there are two respondents **In replication** there is only one responder **because of** the unavailability of one of the respondents
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *2*	**Originally**, the brief training (warming up) is 1 week **In replication** the brief training (warming up) is 6 week **In order to** explore the warming up effect
Modified Dimension	**Operationalization**, ***(***Name***)
Threat to validity	The change increases the construct validity

Table 20. Instantiation of the proposed template in E-2015

Field	Value
E-2015	Replication of experiment *E-2013*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, the brief training (warming up) is 1 week **In replication** the brief training (warming up) is 2 week **In order to** explore the warming up effect
Modified Dimension	**Operationalization**, ***(***Name***)
Threat to validity	The change increases the construct validity

Table 21. Instantiation of the proposed template in VV-UPM1

Field	Value
VV-UPM1	Replication of experiment *VV-UPM*
Type of replication	Internal
Purpose	Extend results
Change *1*	**Originally**, the visibility of the fault is not analysed **In replication** the influence of the visibility of the fault is analysed **in order to** draw new conclusions
Modified Dimension	**Operationalization**, ***(***Name***)
Threat to validity	The change ***(***Threat***)
Comments	Laboratory package developed by Kamsties and Lott is used
Change *2*	**Originally**, the influence of the programme is not analysed **In replication** two versions of each program are implemented and is a new factor **because** the programs are not very long and therefore the errors are masked from each other
Modified Dimension	**Operationalization**, specifically the independent variable *version*
Threat to validity	The change increases the construct validity
Change *3*	**Originally**, three of the fault types appear only once while the other three types appear twice **In replication** all types of faults are duplicated **because** there are two versions of each program
Modified Dimension	**Protocol**, specifically the experimental material
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, subjects generate their test cases to detect code failures **In replication** first, the subjects apply the technique to generate the test cases and then execute the test cases provided to them to detect program failures **in order to** check whether the visibility of faults influences their detection
Modified Dimension	**Protocol**, specifically the experimental material
Threat to validity	The change increases the internal validity
Change *5*	**Originally**, four programs are used **In replication** three programs are used, one is discarded **in order to** balance the design
Modified Dimension	**Protocol**, specifically the experimental material
Threat to validity	The change increases the internal validity
Change *6*	**Originally**, each subject applies a technique **In replication** each subject applies the three techniques **because** the design is changed
Modified Dimension	**Protocol**, specifically the experimental design
Threat to validity	The change increases the internal validity

Table 22. Instantiation of the proposed template in VV-UPV

Field	Value
VV-UPV	Replication of experiment *VV-UPM*
Site	Polytechnic University of Valencia
Type of replication	External
Purpose	Extend results
Change *1*	**Originally**, the three verification and validation techniques are used: code reading, equivalence partitioning and branch testing **In replication** the code reading technique is omitted **because of** time constraints
Modified Dimension	**Operationalization**, specifically the independent variable *technique*
Threat to validity	The change increases the construct validity
Comment	The baseline experiment are UPM replications treated as one
Change *2*	**Originally**, the duration of the 3 sessions is 4h. each, i.e. the time is unlimited **In replication** the duration of each of the 3 sessions is 2h. **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *3*	**Originally**, subjects receive three four-hour training sessions to learn how to apply the techniques **In replication** the training consists of two two-hour tutorials **because** he subjects are already familiar with the techniques
Modified Dimension	**Operationalization**, specifically the independent variable *training*
Threat to validity	The change increases the construct validity
Change *4*	**Originally**,the training in the use of the techniques is before the experiment is executed **In replication** Each tutorial is carried out before the application of the technique, in the first 2 sessions; i. e., the training is interspersed with the operation of the experiment **because** he subjects are already familiar with the techniques
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *5*	**Originally**, subjects apply a technique to a program in each session **In replication** subjects apply the same technique to different programs in each session **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *6*	**Originally**, The subjects execute test cases with the application of the technique; that is to say in each session **In replication** Subjects run test cases for one of the programs they have tested in a separate session, i.e. in session 3 **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity

Table 23. Instantiation of the proposed template in VV-Uds

Field	Value
VV-Uds	Replication of experiment *VV-UPM*
Type of replication	External
Purpose	Extend results
Change *1*	**Originally**, the duration of the 3 sessions is 4h. each, i.e. the time is unlimited **In replication** the duration of each of the 3 sessions is 2h. **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *2*	**Originally**, the subjects execute test cases with the application of the technique; i. e. in each session **In replication** the subjects execute test cases for one of the programs they have tested in a later session, i.e. in session 4 **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *3*	**Originally**, subjects work individually **In replication** subjects work in pairs **because** there are not enough computers
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, subjects receive three four-hour training sessions to learn how to apply the techniques **In replication** the training consists of two two-hour tutorials **because** he subjects are already familiar with the techniques
Modified Dimension	**Operationalization**, specifically the independent variable *training*
Threat to validity	The change increases the construct validity
Change *5*	**Originally**,the training in the use of the techniques is before the experiment is executed **In replication** each tutorial is conducted before the application of the technique in each of the three sessions in which each technique is examined; i.e., the training is interspersed with the operation of the experiment **because** he subjects are already familiar with the techniques
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity

Table 24. Instantiation of the proposed template in VV-ORT

Field	Value
VV-ORT	Replication of experiment *VV-UPM*
Type of replication	External
Purpose	Extend results
Change *1*	**Originally**, the three techniques of verification and validation are used: code reading, equivalence partitioning and branch testing **In replication** the code reading technique is omitted **because of** time constraints
Modified Dimension	**Operationalization**, specifically the independent variable *technique*
Threat to validity	The change ***(***Threat***)
Change *2*	**Originally**, three program codes are used **In replication** one of the programs is discarded **because of** time constraints
Modified Dimension	**Protocol**, specifically experimental material
Threat to validity	The change ***(***Threat***)
Change *3*	**Originally**, the experiment is carried out in three sessions each of four hours **In replication** the experiment is executed in a single session **because of** time constraints
Modified Dimension	**Protocol**, specifically the guides
Threat to validity	The change increases the internal validity
Change *4*	**Originally**, subjects apply a different technique to evaluate a program in each of the three sessions **In replication** the subjects apply the two techniques to the two programs in a single session **because of** time constraints
Modified Dimension	**Protocol**, specifically experimental design
Threat to validity	The change increases the internal validity