Appendix

Table A.1: details of the first section of our questionnaire, addressing the profile of our respondents and their usage of the CHIMACTIV website.

General introduction of the questionnaire		
The teaching team behind the CHIMACTIV website wishes to collect factual data on the site's usefulness for learning, in order to promote its use by other teachers and students. The results obtained from your (anonymous) responses to this questionnaire may be presented at a conference or published in a scientific article. Thank you in advance for the time you take to complete this questionnaire. The questionnaire is composed of two sub-questionnaires: one on the perception of self-efficacy (12 questions) and the other on the perception of anxiety (20 questions). It was developed based on validated questionnaires published in the chemistry education literature. Several questions address the same topic from different angles, which strengthens the reliability of the questionnaire.		
French translation of the general introduction of the questionnaire		
L'équipe enseignante conceptrice du site CHIMACTIV souhaite disposer de données factuelles quant à l'intérêt du site pour les apprentissages, afin de favoriser son utilisation par d'autres enseignant·es et étudiant·es. Les résultats obtenus grâce aux réponses (anonymes) à ce questionnaire pourront faire l'objet d'une communication dans un colloque ou d'un article scientifique. Merci d'avance pour le temps que vous consacrerez à remplir ce questionnaire. Il est composé 2 sous-questionnaires : un sur la perception du sentiment d'auto-efficacité (12 questions) et l'autre sur la perception de l'anxiété (20 questions). Il a été établi sur la base de questionnaires validés et publiés dans la littérature relative à l'enseignement de la chimie. Plusieurs questions traitent d'un même sujet avec différentes nuances, c'est ce qui fait la robustesse du questionnaire.		
Student's profile	**Items with options for the answers**	**French translations of the items with options for the answers**
	Gender: male / female / non-binary	**Vous êtes** : un homme/ une femme / non binaire
	Your current academic level during this school year (Year N) (for engineering curriculum: 1A = L3, 2A = M1, 3A = M2): L1 / L2 / L3 / M1 / M2	**Votre niveau d'étude durant l'année scolaire en cours (année N)** (pour cursus ingénieur : 1A = L3, 2A = M1, 3A = M2) : L1 / L2 / L3 / M1 / M2
	Your previous academic background: • **Year N-1:** Level – High School, CPGE, L1, L2, L3, M1, M2, IUT, BTS, Other Main discipline: Biology / Chemistry / Physics / Physics-Chemistry / Chemistry-Biology / Other (please specify) • **Year N-2:** Level – High School, CPGE, L1, L2, L3, M1, M2, IUT, BTS, Other Main discipline: Biology / Chemistry / Physics / Physics-Chemistry / Chemistry-Biology / Other (please specify)	**Votre cursus antérieur :** • **année N-1 :** Niveau – Lycée, CPGE, L1, L2, L3, M1, M2, IUT, BTS, autre Discipline principale : Biologie / Chimie / Physique / Physique - Chimie / Chimie - Biologie / Autre (précisez) • **année N-2 :** Niveau - Lycée, CPGE, L1, L2, L3, M1, M2, IUT, BTS, autre Discipline principale : Biologie / Chimie / Physique / Physique - Chimie / Chimie - Biologie / Autre (précisez)
	Did you consult the CHIMACTIV website during this course? Yes / No	**Avez-vous consulté le site CHIMACTIV durant cet enseignement ?** Oui / Non
	If yes, how many times did you consult the website during this course? 1 time / 2–5 times / 6–10 times / 11 times or more	**Si oui, nombre de consultations durant cet enseignement :** 1 fois / 2 à 5 fois / 6 à 10 fois / 11 fois ou plus
	If yes, average time spent per consultation during this course: <2 min; 2–5 min; 5–15 min; 15–30 min; 30 min–1 h; >1 h	**Si oui, temps moyen de consultation durant cet enseignement :** < 2min ; 2 à 5 min ; 5 à 15 min ; 15 à 30 min ; 30 min à 1h ; > 1h

Table A.2: details of the second section related to self-efficacy in our questionnaire. Changes made to the wording of the ESE questionnaire to incorporate the effect of the CHIMACTIV website are detailed (cf. modified ESE), and its French translation used in our questionnaire is presented. The self-efficacy definition and explanation provided for our students at the beginning of this section is also indicated.

Self-efficacy belief definition and explanation			
"Self-efficacy: a person's judgement of their ability to organize and use the various activities necessary to accomplish a task." "A student's level of self-efficacy reflects the beliefs about their abilities to successfully complete an action." Your level of self-efficacy can influence your behavior both before and during a task.			
French translation of the self-efficacy belief definition and explanation			
« Sentiment d'auto-efficacité : jugement que porte une personne sur sa capacité d'organiser et d'utiliser les différentes activités inhérentes à la réalisation d'une tâche à exécuter. » « Le niveau de sentiment d'auto-efficacité d'un élève reflète sa croyance à pouvoir accomplir une tâche dans un domaine donné.» Votre niveau de sentiment d'auto-efficacité peut ainsi modifier votre comportement avant et pendant une tâche.			
Dimension	**Original ESE questionnaire**	**Modified ESE questionnaire**	**French translation of the modified ESE questionnaire**
Conceptual understanding	Q1- I believe I have a sound grasp of the theory behind laboratory experiments before performing experiments.	Q1- Thanks to the CHIMACTIV website, I believe I have a better sound grasp of the theory behind laboratory experiments before performing experiments	Q1- Grâce au site CHIMACTIV je crois avoir une meilleure compréhension de la théorie sous-jacente aux expériences de laboratoire avant de les réaliser
	Q2- Experimental concepts become clearer to me as I perform the experiment	Q2- More frequently with the help of CHIMACTIV, experimental concepts become clearer to me as I perform the experiment.	Q2- Avec l'aide de CHIMACTIV les concepts expérimentaux m'apparaissent plus clairs quand je réalise les expériences.
	Q3- I am confident that I understand the underlying chemical phenomena in the experiment.	Q3- Thanks to the CHIMACTIV resources, I am more confident that I understand the underlying chemical phenomena in the experiment.	Q3- Grâce aux ressources CHIMACTIV je suis plus confiant·e dans ma compréhension des phénomènes chimiques sous-jacents aux expériences.
Laboratory hazards	Q4- I can usually handle the glass apparatus in the laboratory on my own without any fear of breakage and injury.	Q4- Thanks to the CHIMACTIV website, I can usually better handle the glass apparatus in the laboratory on my own without any fear of breakage and injury.	Q4- Grâce au site CHIMACTIV je peux généralement mieux manipuler la verrerie par moi-même au laboratoire sans crainte de casse ou de blessure.
	Q5- I am confident of working in the laboratory without chemical spillage.	Q5- After having consulted the CHIMACTIV resources, I am more confident of working in the laboratory without chemical spillage.	Q5- Après avoir consulté les ressources CHIMACTIV je me sens plus en confiance pour travailler dans le laboratoire sans renverser de produits chimiques.
	Q6- I am always alert in the laboratory and have minimal accidents	Q6- By consulting the CHIMACTIV website, I am always more alert in the laboratory and have fewer minimal accidents.	Q6- En consultant le site CHIMACTIV je suis toujours plus vigilant·e au laboratoire et j'ai moins d'accidents mineurs.
Procedural complexity	Q7- After an experiment, I have no difficulty figuring out how my calculation procedures and errors affected my results	Q7- More frequently with the help of CHIMACTIV, after an experiment I have no difficulty figuring out how my calculation procedures and errors affected my results.	Q7- Avec l'aide de CHIMACTIV, après une expérience je n'ai pas de difficulté à comprendre comment mes procédures de calcul et mes erreurs ont affecté mes résultats.
	Q8- When presented with laboratory results, I know how to interpret them and draw relevant conclusions from them	Q8- Thanks to the CHIMACTIV website, when presented with laboratory results, I know better how to interpret them and draw relevant conclusions from them.	Q8- Grâce à CHIMACTIV, lorsque l'on me présente des résultats de laboratoire, je sais mieux comment les interpréter et en tirer des conclusions pertinentes.
	Q9- I do not struggle with processing information in background articles and	Q9- More frequently with the help of CHIMACTIV, I do not struggle with processing information in	Q9- Avec l'aide de CHIMACTIV je n'ai pas de mal à traiter les informations contenues dans des documents de

	relating them to my own laboratory procedures and results.	background articles and relating them to my own laboratory procedures and results.	référence et à les relier à mes propres procédures et résultats de laboratoire.
Sufficiency of resources	Q10- I find it easy to complete the exercise in the laboratory even though there is limited personal participation in performing experiments.	Q10- Thanks to the CHIMACTIV website, I find it easier to complete the exercise in the laboratory even though there is limited personal participation in performing experiments.	Q10- Grâce au site CHIMACTIV il m'est plus facile de réaliser la manipulation en laboratoire, même si ma participation personnelle à la réalisation des expériences est limitée.
	Q11- It is easy for me to understand theory and concepts properly in spite of limited availability of physical instruments	Q11- Thanks to the CHIMACTIV resources, it is easier for me to understand theory and concepts properly in spite of limited availability of physical instruments.	Q11- Grâce aux ressources CHIMACTIV il m'est plus facile de comprendre correctement la théorie et les concepts malgré la disponibilité limitée des appareils.
	Q12- I do not find it challenging to understand an experiment even if there is only one try due to limited availability of chemicals	Q12- More frequently with the help of CHIMACTIV, I do not find it challenging to understand an experiment even if there is only one try due to limited availability of chemicals.	Q12- Avec l'aide de CHIMACTIV je ne trouve pas difficile de comprendre une expérience, même s'il n'y a qu'un seul essai en raison de la disponibilité limitée des produits chimiques.

Table A.3: details of the third section related to anxiety in our questionnaire. Changes made to the wording of the CLAI questionnaire to incorporate the effect of the CHIMACTIV website are detailed (cf. modified CLAI), and its French translation used in our questionnaire is presented. The anxiety definition and explanation provided for our students at the beginning of this section is also indicated.

Anxiety definition and explanation considered in this study			
"Anxiety: an unpleasant (usually temporary) emotional state characterized by feelings of tension, apprehension, nervousness and worry." If you are in an anxious state, you will be more easily distracted, suffer from negative cognitive interference, and this state could have a negative impact on your academic performance.			
French translation of the anxiety definition and explanation			
« Anxiété : état émotionnel désagréable (en général temporaire), se caractérisant par des sentiments de tension, d'appréhension, de nervosité, d'inquiétude. » Si vous êtes dans un état anxieux, vous êtes plus facilement déconcentré(e), vous présentez des interférences cognitives négatives et cet état peut avoir un impact négatif sur vos résultats académiques.			
Dimension	**Original CLAI questionnaire**	**Modified CLAI questionnaire**	**French translation of the modified CLAI questionnaire**
Working with chemicals	Q1- I am anxious when I use chemicals during lab	Q1- Thanks to the CHIMACTIV website, I am less anxious when I use chemicals during lab	Q1- Grâce au site CHIMACTIV je suis moins anxieux ou anxieuse lorsque j'utilise des produits chimiques au laboratoire
Using equipment and procedures	Q2- When I work in the chemistry lab, I feel at ease using the equipment	Q2- When I work in the chemistry lab, I feel more at ease using the equipment thanks to the tutorials and videos of CHIMACTIV	Q2- Quand je travaille dans un laboratoire de chimie, je me sens plus à l'aise dans l'utilisation des appareils grâce aux tutoriels et vidéos de CHIMACTIV
Collecting data	Q3- When I get ready for lab, I get concerned about recording the data we will generate.	Q3- When I get ready for lab, I get less concerned about recording the data we will generate thanks to the CHIMACTIV resources	Q3- Quand je consulte CHIMACTIV pour me préparer à une séance en laboratoire, je suis moins inquiet ou inquiète quant à l'acquisition des données expérimentales que nous allons produire
Working with other students	Q4- When I work in the chemistry lab, I feel nervous working with other students	Q4- When I work in the chemistry lab, I feel less nervous working with other students thanks to the CHIMACTIV website consultation	Q4- Quand je travaille au laboratoire de chimie, je me sens moins nerveux ou nerveuse pour travailler avec d'autres étudiant·es grâce à la consultation du site CHIMACTIV
Having adequate time	Q5- I worry about whether I have enough time to complete the lab.	Q5- Thanks to the CHIMACTIV website, I worry less about whether I have enough time to complete the lab	Q5- Grâce au site CHIMACTIV je me soucie moins de savoir si j'ai assez de temps pour terminer la séance expérimentale ou le TP
Working with chemicals	Q6- When I get ready for chemistry lab, I get concerned about the chemicals we will use	Q6- When I get ready for chemistry lab, I get less concerned about the chemicals we will use thanks to the CHIMACTIV resources	Q6- Quand je consulte CHIMACTIV pour me préparer à une séance en laboratoire, je suis moins préoccupé·e par les produits chimiques que nous allons utiliser
Using equipment and procedures	Q7- When working in the chemistry lab, I feel nervous carrying out the lab procedures	Q7- When working in the chemistry lab, I feel less nervous carrying out the lab procedures thanks to the CHIMACTIV resources	Q7- Grâce aux ressources de CHIMACTIV, quand je travaille dans le laboratoire de chimie, je me sens moins nerveux ou nerveuse lorsque je réalise les procédures de laboratoire
Collecting data	Q8- I am anxious when I record data during lab	Q8- With the help of CHIMACTIV, I am less anxious when I record data during lab	Q8- Avec l'aide de CHIMACTIV je suis moins anxieux ou anxieuse lorsque j'acquiers des données expérimentales pendant la séance en laboratoire
Working with other students	Q9- I feel comfortable working with other students when I am in lab	Q9- I feel more comfortable working with other students when I am in lab thanks to the CHIMACTIV website consultation	Q9- Je me sens plus à l'aise de travailler avec d'autres étudiant·es lorsque je suis en laboratoire grâce à la consultation du site CHIMACTIV
Having	Q10- When working in the	Q10- When working in the lab, I	Q10- Lorsque je travaille au laboratoire, je

adequate time	lab, I am nervous about the time it will take	am less nervous about the time it will take thanks to the CHIMACTIV resources	suis moins nerveux ou nerveuse quant au temps que cela va prendre grâce aux ressources de CHIMACTIV
Working with chemicals	Q11- I am comfortable being near chemicals when I am in lab	Q11- With the help of CHIMACTIV, I am more comfortable being near chemicals when I am in lab	Q11- Avec l'aide de CHIMACTIV je suis plus à l'aise d'être à proximité de produits chimiques lorsque je suis au laboratoire
Using equipment and procedures	Q12- I am anxious when I carry out a lab procedure	Q12- I am less anxious when I carry out a lab procedure thanks to the tutorials and videos of CHIMACTIV	Q12- Je suis moins anxieux ou anxieuse lorsque je réalise une procédure de laboratoire grâce aux tutoriels et aux vidéos de CHIMACTIV
Collecting data	Q13- When working in the chemistry lab, I feel nervous about recording the data I will need	Q13- When working in the chemistry lab, I feel less nervous about recording the data I will need thanks to the CHIMACTIV resources	Q13- Grâce aux ressources CHIMACTIV, lorsque je travaille au laboratoire de chimie, je me sens moins nerveux ou nerveuse à l'idée d'acquérir les données expérimentales dont j'aurai besoin
Working with other students	Q14- I feel anxious when I work with other students during lab	Q14- With the help of CHIMACTIV, I feel less anxious when I work with other students during lab	Q14- Avec l'aide de CHIMACTIV je me sens moins anxieux ou anxieuse lorsque je travaille avec d'autres étudiant·es en laboratoire
Having adequate time	Q15- When preparing for lab, I am concerned about the time available for doing the experiment	Q15- When preparing for lab by consulting the CHIMACTIV website, I am less concerned about the time available for doing the experiment	Q15- Quand je consulte CHIMACTIV pour me préparer à une séance en laboratoire, je suis moins préoccupé·e par le temps mis à ma disposition pour réaliser les expériences
Working with chemicals	Q16- When working in the chemistry lab, I feel nervous being around the chemicals	Q16- When working in the chemistry lab, I feel less nervous being around the chemicals thanks to the CHIMACTIV resources	Q16- Lorsque je travaille au laboratoire, je me sens moins nerveux ou nerveuse d'être à proximité de produits chimiques grâce aux ressources CHIMACTIV
Using equipment and procedures	Q17- I feel anxious when I use equipment during lab	Q17- I feel less anxious when I use equipment during lab thanks to the tutorials and videos of CHIMACTIV	Q17 Je me sens moins anxieux ou anxieuse lorsque j'utilise des appareils en laboratoire grâce aux tutoriels et vidéos de CHIMACTIV
Collecting data	Q18- When working in the chemistry lab, I feel at ease recording the necessary data	Q18- When working in the chemistry lab, I feel more at ease recording the necessary data thanks to the CHIMACTIV resources	Q18- Lorsque je travaille au laboratoire de chimie, je me sens plus à l'aise pour acquérir les données expérimentales nécessaires grâce aux ressources de CHIMACTIV
Working with other students	Q19- When I get ready for chemistry lab, I get concerned about working with other students	Q19- When I get ready for chemistry lab by consulting the CHIMACTIV resources, I get less concerned about working with other students	Q19- Quand je me prépare pour le labo de chimie en consultant les ressources CHIMACTIV, je suis moins préoccupé·e par travailler avec d'autres étudiant·es
Having adequate time	Q20- I am comfortable with the amount of time available for doing the lab	Q20- With the help of CHIMACTIV, I am more comfortable with the amount of time available for doing the lab	Q20- Avec l'aide de CHIMACTIV je suis plus à l'aise avec le temps disponible pour réaliser les expériences

Table A.4: details of experiments carried out during the practical sessions, for each cohort considered.

Cohort code	Aim of the practical sessions	Key experiments carried out by the students
1	Analyze a mineral or tap water using various analytical techniques	Electrical conductivity determination Water hardness quantification by titration Calcium and magnesium ions quantification by titration Fluoride, nitrate and sodium ions quantification using specific electrodes Dissolved oxygen determination by titration (Winkler's method) Chloride and sulfate ions quantification by titration Ion concentration quantification by reflectometry Hydrogenocarbonate ions determination by titration
2	Acquire expertise in reproducing existing experimental procedures (the aims are freely chosen by the students), in order to be able to propose them as experimental sessions for their future students	The experimental procedures are freely chosen by the students who are future teachers (e.g. quantification of mineral water hardness by titration, quantification of chloride ions in physiological saline by titration)
3	Acquire expertise in sample preparation, chromatographic techniques as well as detection methods for quantification and/or identification, based on illustrative case studies	Extraction of limonene from orange peel and quantification by GC-FID (internal calibration) or GC-MS (standard additions and internal calibration) Liquid extraction and identification by GC-MS of volatile compounds in citrus juice (orange and lemon) and orange peel Determination of vanillin and ethyl vanillin in vanilla-flavored sugars by HPLC- UV/DAD (external calibration) after solid phase extraction Separation and detection of polycyclic aromatic hydrocarbons by HPLC-UV/DAD-FLD Ethanol content determination in alcoholic beverages using FTIR spectroscopy (external and standard addition calibration) Quantification of compounds in a binary mixture using absorption spectroscopy
4 and 5	Check the nutritional composition of a biscuit	Dry matter determination Protein quantification using Kjeldahl method Lipid quantification after Soxhlet extraction Fatty acid profile by GC-MS Vitamin E quantification by HPLC- UV/DAD-FLD
	Identify the heat treatment applied to vegetable oils rich in omega-3	Acid index by titrimetry Iodine value by titrimetry Peroxide value by titrimetry Tocopherols quantification by HPLC- UV/DAD-FLD
	Find solutions to limit enzymatic browning in apple puree, and explain the mechanisms involved	Formulation of apple purees pH measurement of a suspension Color measurement of suspensions using Lab* colorimetry Extraction of polyphenol oxidases from apples Measurement of PPO activity from apples in absence/presence of enzymes inhibitors
6	Determine the pollutant (diflofenac) concentration in a surface water	Standards' preparation for the calibration curve Solid-phase extraction of the pollutant Extract concentration using nitrogen flow Diclofenac quantification by HPLC- UV/DAD (external calibration)

Table A.5: descriptive statistics for all the data collected relative to self-efficacy (cohorts 2-6; 76 students).

Question	Mean	Median	Standard deviation	Skewness	Kurstosis
Q1- Thanks to the Chimactiv website, I believe I have a better sound grasp of the theory behind laboratory experiments before performing experiments	4.24	4.00	0.67	-0.32	-0.77
Q2- More frequently with the help of Chimactiv, experimental concepts become clearer to me as I perform the experiment.	4.24	4.00	0.69	-0.35	-0.85
Q3- Thanks to the Chimactiv resources, I am more confident that I understand the underlying chemical phenomena in the experiment.	4.00	4.00	0.77	-0.37	-0.27
Q4- Thanks to the Chimactiv website, I can usually better handle the glass apparatus in the laboratory on my own without any fear of breakage and injury.	3.61	4.00	1.12	-0.39	-0.58
Q5- After having consulted the Chimactiv resources, I am more confident of working in the laboratory without chemical spillage.	3.42	3.00	1.15	-0.35	-0.54
Q6- By consulting the Chimactiv website, I am always more alert in the laboratory and have fewer minimal accidents.	3.57	4.00	1.06	-0.35	-0.32
Q7- More frequently with the help of Chimactiv, after an experiment I have no difficulty figuring out how my calculation procedures and errors affected my results.	3.58	3.50	0.98	-0.10	-0.60
Q8- Thanks to the Chimactiv website, when presented with laboratory results, I know better how to interpret them and draw relevant conclusions from them.	3.67	4.00	1.01	-0.32	-0.62
Q9- More frequently with the help of Chimactiv, I do not struggle with processing information in background articles and relating them to my own laboratory procedures and results.	3.59	4.00	0.88	-0.29	0.00
Q10- Thanks to the Chimactiv website, I find it easier to complete the exercise in the laboratory even though there is limited personal participation in performing experiments.	3.72	4.00	0.96	-0.43	-0.28
Q11- Thanks to the Chimactiv resources, it is easier for me to understand theory and concepts properly in spite of limited availability of physical instruments.	3.99	4.00	0.76	-0.17	-0.72
Q12- More frequently with the help of Chimactiv, I do not find it challenging to understand an experiment even if there is only one try due to limited availability of chemicals.	3.83	4.00	0.84	0.06	-1.04

Table A.6: descriptive statistics for all the data collected relative to anxiety (all cohorts; 89 students).

Question	Mean	Median	Standard deviation	Skewness	Kurstosis
Q1- Thanks to the Chimactiv website, I am less anxious when I use chemicals during lab	3.24	3.00	1.07	-0.03	-0.37
Q2- When I work in the chemistry lab, I feel more at ease using the equipment thanks to the tutorials and videos of Chimactiv	3.85	4.00	0.83	-0.44	0.39
Q3- When I get ready for lab, I get less concerned about recording the data we will generate thanks to the Chimactiv resources	3.70	4.00	0.90	-0.32	-0.12
Q4- When I work in the chemistry lab, I feel less nervous working with other students thanks to the Chimactiv website consultation	3.38	3.00	1.12	-0.31	-0.45
Q5- Thanks to the Chimactiv website, I worry less about whether I have enough time to complete the lab	3.12	3.00	1.14	0.28	-0.80
Q6- When I get ready for chemistry lab, I get less concerned about the chemicals we will use thanks to the Chimactiv resources	3.24	3.00	1.12	0.02	-0.46
Q7- When working in the chemistry lab, I feel less nervous carrying out the lab procedures thanks to the Chimactiv resources	3.52	4.00	1.01	-0.25	-0.50
Q8- With the help of Chimactiv, I am less anxious when I record data during lab	3.43	3.00	1.03	-0.05	-0.39
Q9- I feel more comfortable working with other students when I am in lab thanks to the Chimactiv website consultation	3.33	3.00	1.13	-0.04	-0.59
Q10- When working in the lab, I am less nervous about the time it will take thanks to the Chimactiv resources	3.14	3.00	1.10	0.04	-0.53
Q11- With the help of Chimactiv, I am more comfortable being near chemicals when I am in lab	3.25	3.00	0.98	-0.00	0.04
Q12- I am less anxious when I carry out a lab procedure thanks to the tutorials and videos of Chimactiv	3.76	4.00	0.87	-0.48	0.25
Q13- When working in the chemistry lab, I feel less nervous about recording the data I will need thanks to the Chimactiv resources	3.47	3.00	0.91	-0.34	0.51
Q14- With the help of Chimactiv, I feel less anxious when I work with other students during lab	3.24	3.00	1.10	-0.06	-0.41
Q15- When preparing for lab by consulting the Chimactiv website, I am less concerned about the time available for doing the experiment	3.26	3.00	1.08	0.01	-0.82
Q16- When working in the chemistry lab, I feel less nervous being around the chemicals thanks to the Chimactiv resources	3.34	3.00	1.04	-0.11	-0.34
Q17- I feel less anxious when I use equipment during lab thanks to the tutorials and videos of Chimactiv	3.69	4.00	0.92	-0.30	-0.29
Q18- When working in the chemistry lab, I feel more at ease recording the necessary data thanks to the Chimactiv resources	3.57	3.00	0.96	0.02	-0.62
Q19- When I get ready for chemistry lab by consulting the Chimactiv resources, I get less concerned about working with other students	3.38	3.00	1.15	-0.16	-0.73
Q20- With the help of Chimactiv, I am more comfortable with the amount of time available for doing the lab	3.43	3.00	1.10	-0.23	-0.58

Table A.7: Spearman rho correlations between the dimensions of chemistry laboratory self-efficacy and anxiety reduction explored in this study (data from cohorts 2 to 6; 76 students). Values above 0.50 are indicated in bold character (** significance level of 1%).

Correlations considered	Rho values	p- values
conceptual understanding (self-efficacy) - using equipment and procedures (anxiety)	**0.54****	3.7×10^{-7}
conceptual understanding (self-efficacy) – working with chemicals (anxiety)	0.44**	6.1×10^{-5}
conceptual understanding (self-efficacy) – collecting data (anxiety)	0.48**	1.4×10^{-5}
conceptual understanding (self-efficacy) – having adequate time (anxiety)	0.41**	2.0×10^{-4}
conceptual understanding (self-efficacy) - working with other students (anxiety)	0.47**	2.0×10^{-5}
procedural complexity (self-efficacy) – using equipment and procedures (anxiety)	0.40**	3.0×10^{-4}
procedural complexity (self-efficacy) – working with chemicals (anxiety)	0.40**	4.0×10^{-4}
procedural complexity (self-efficacy) – collecting data (anxiety)	0.48**	9.4×10^{-6}
procedural complexity (self-efficacy) – having adequate time (anxiety)	0.41**	3.0×10^{-4}
procedural complexity (self-efficacy) – working with other students (anxiety)	**0.54****	6.5×10^{-7}
laboratory hazards (self-efficacy) – working with chemicals (anxiety)	**0.65****	2.2×10^{-10}
laboratory hazards (self-efficacy) - using equipment and procedures (anxiety)	**0.52****	1.3×10^{-6}
laboratory hazards (self-efficacy) – collecting data (anxiety)	**0.54****	6.4×10^{-7}
laboratory hazards (self-efficacy) – having adequate time (anxiety)	0.40**	4.0×10^{-4}
laboratory hazards (self-efficacy) - working with other students (anxiety)	**0.53****	1.0×10^{-6}
sufficiency of resources (self-efficacy) - using equipment and procedures (anxiety)	**0.68****	2.3×10^{-11}
sufficiency of resources (self-efficacy) - working with chemicals (anxiety)	**0.59****	1.9×10^{-8}
sufficiency of resources (self-efficacy) - collecting data (anxiety)	**0.60****	1.2×10^{-8}
sufficiency of resources (self-efficacy) - having adequate time (anxiety)	**0.52****	1.7×10^{-6}
sufficiency of resources (self-efficacy) – working with other students (anxiety)	**0.60****	1.4×10^{-8}

Figure A.1: classification of the individual scores obtained for the experimental self-efficacy (76 students): 12 to 23 points (low self-efficacy), 24 to 35 points (below average self-efficacy), 36 to 47 points (above average self-efficacy), 48 to 60 points (high self-efficacy). *For each category, values indicated are the number of students concerned and their corresponding percentage considering the total of students.*

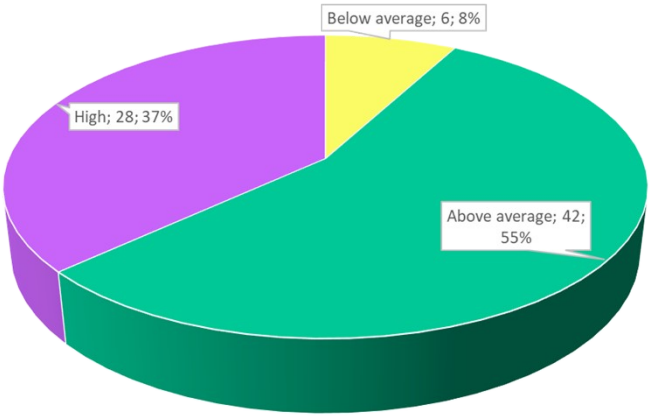


Figure A.2: classification of the individual scores obtained for the chemistry laboratory anxiety (89 students): 20 to 39 points (low anxiety reduction), 40 to 59 points (below average anxiety reduction), 60 to 79 points (above average anxiety reduction), 80 to 100 points (high anxiety reduction). *For each category, values indicated are the number of students concerned and their corresponding percentage considering the total of students.*

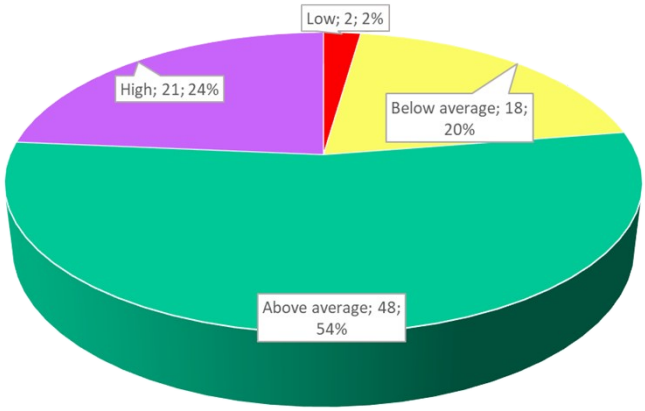
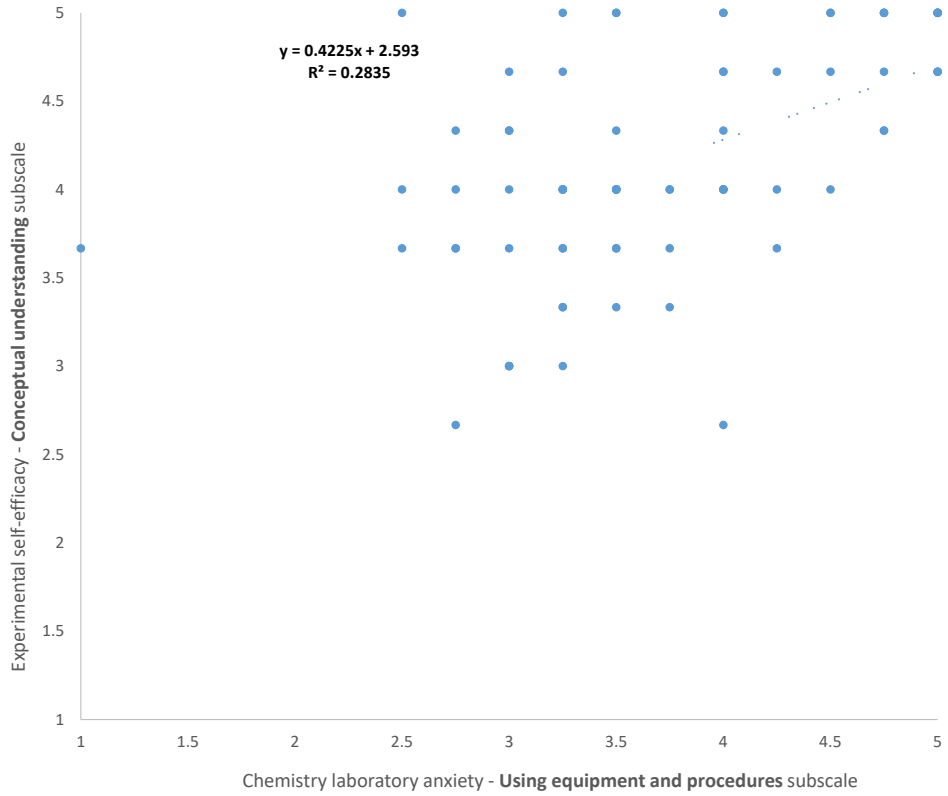
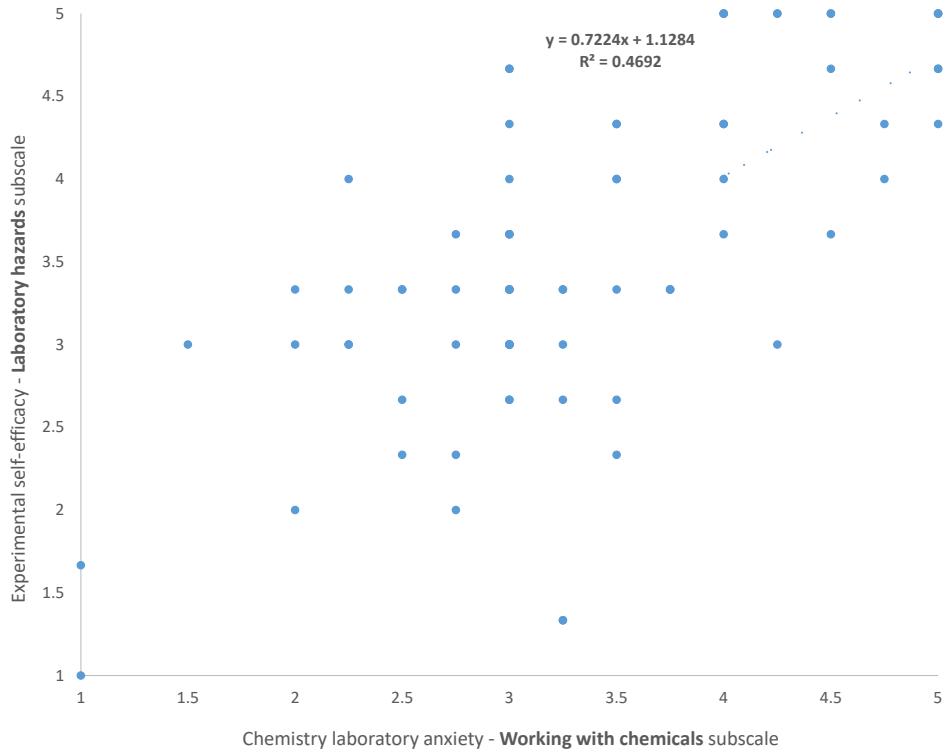


Figure A.3: graphs showing different subscale correlations (cohorts 2-6; 76 students).

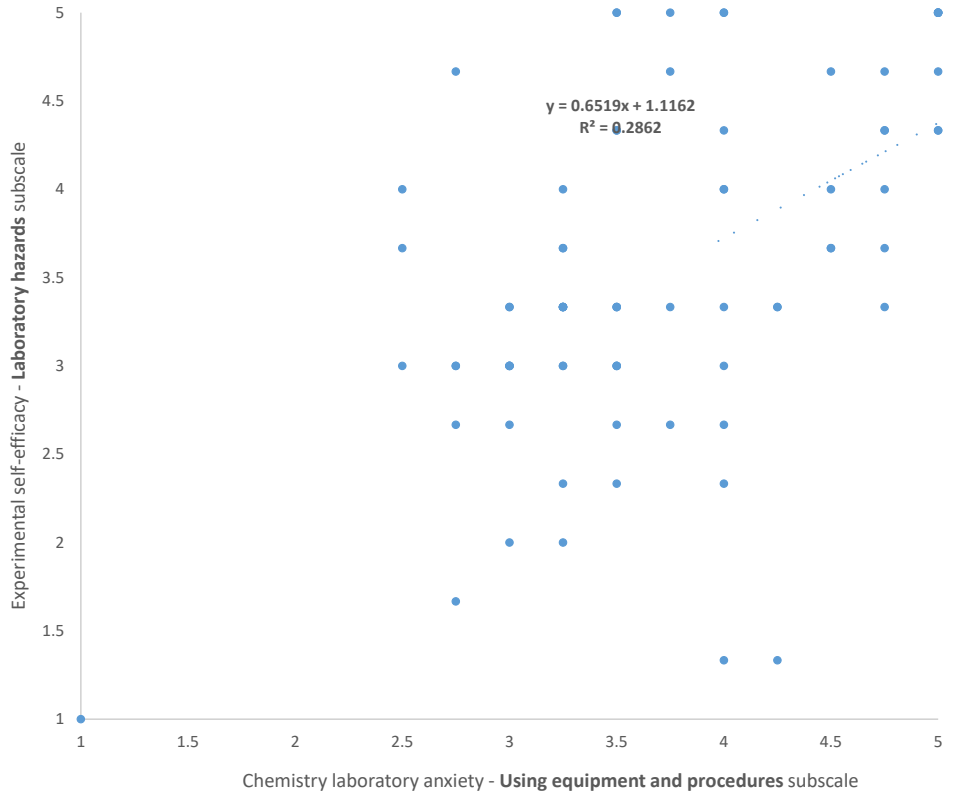
Subscale correlation: conceptual understanding (self-efficacy) - using equipment and procedures (anxiety)



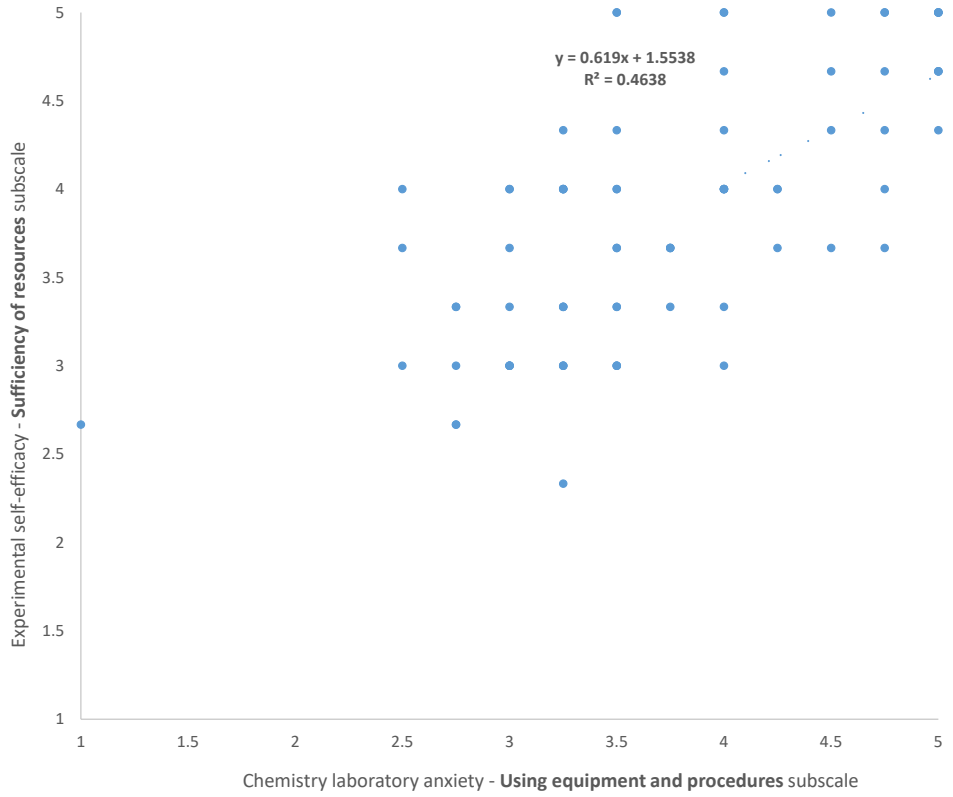
Subscale correlation: laboratory hazards (self-efficacy) – working with chemicals (anxiety)



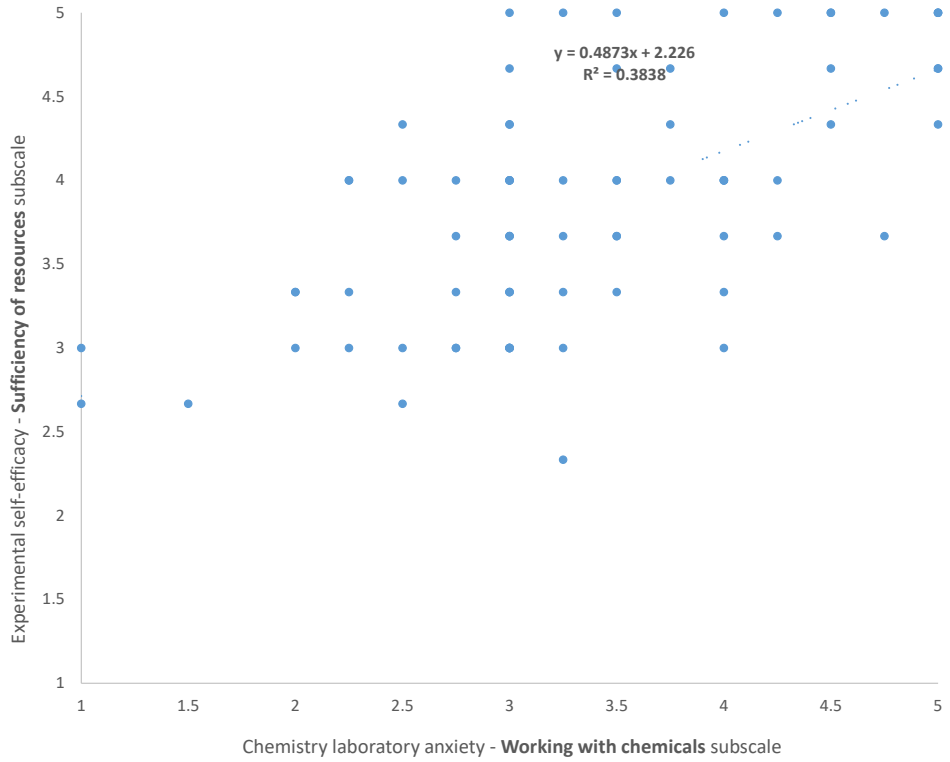
Subscale correlation: laboratory hazards (self-efficacy) - using equipment and procedures (anxiety)



Subscale correlation: sufficiency of resources (self-efficacy) - using equipment and procedures (anxiety)



Subscale correlation: sufficiency of resources (self-efficacy) - working with chemicals (anxiety)



Subscale correlation: sufficiency of resources (self-efficacy) – collecting data (anxiety)