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**Evaluación de la Docencia del Máster:
Computational Biomedical Engineering
2017-2018 Academic Course**

Octubre, 2018

Index

1. INTRODUCCIÓN	3
2. PRESENTACIÓN DEL INSTRUMENTO	4
3. RESULTADOS OBTENIDOS	6
CONCLUSIONES	21

1. Introducción

A raíz de la construcción de la Unidad de Coordinación Académica de Ingenierías y TIC (UCA EiTIC), la Unidad de Apoyo a la Calidad y la Innovación Docente (USQUID) del centro inició el curso 2016-2017 una serie de estudios centrados en la satisfacción discente de los programas de máster del Departamento. En este documento en concreto se recogen los resultados obtenidos en el marco del *Computational Biomedical Engineering* en el curso 2017-2018 así como algunas comparativas con los resultados obtenidos el curso anterior (2016-2017).

El cuestionario diseñado con este fin fue enviado al estudiantado y recogido de manera anónima una vez presentada la tesis de máster. El índice de respuesta es del 93,3%.

Siguen tanto el cuestionario como los resultados y conclusiones extraídas a partir del estudio.

2. Presentación del instrumento

A continuación el instrumento utilizado para la recopilación de datos e informaciones relacionadas con la satisfacción de la docencia del CBE.

Teaching Evaluation

Dear Students,

In order to collect your feedback to improve courses and teaching practices we ask you to fill the questionnaire below. It's anonymous.

We really thank you in advance

MÀSTER: _____

Please, mark your level of agreement with each affirmation using the scale 1 to 5, being 1 totally disagree with and 5 fully agree with

	1 (totally disagree)	2 (somewh at disagree)	3 (neither agree or disagree)	4 (somewhat agree)	5 (fully agree)
I think that, in general, the courses were useful					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
I think that, in general, the courses were well prepared/presented					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
I think that, in general, the practices/labs, seminars and other educational activities help me to understand the theory worked in lectures					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I think the master was well coordinated					
Please, add here any other information/comment and suggestion about the master coordination:					
I think that, in general, the academic resources provided during the course (material, labs, equipment) were suitable to support my learning process					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
I think that, in general, the educational					

resources by UPF (Library, Aula Global System, etc.) were suitable					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the tutorship advice received <u>before</u> the master started (e.g. in choosing elective courses)					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the tutorship advice and the support by the master coordinator					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the support and attention of the secretariat					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					
In general, I am satisfied with the supervision on my master thesis					
Please, add here any comment about positive aspects related with this item and recommendations for its improvement:					

What did you like the most and the least about the master?

Which are your professional perspectives/intentions after finishing the master? (Do another master, continue your academic career with the PhD, work in a company, you don't know...). **Please, explain us your answer.**

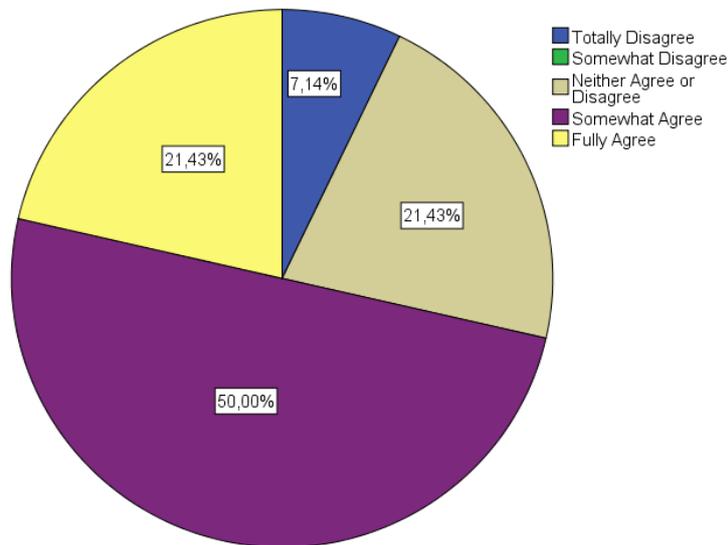
3. Resultados obtenidos

En esta sección se presentan los resultados obtenidos a través de la aplicación del instrumento. En la segunda edición del estudio se recogieron 14 cuestionarios de los 15 estudiantes del máster que presentaron su tesis, esto supone un porcentaje de participación del 93,3% del total.

Para la presentación de los resultados se seguirá el mismo orden de preguntas del propio formulario. Asimismo se presentarán en inglés tanto los ítems recogidos en el formulario como citas textuales extraídas de los formularios recogidos para ser lo más fiel posible a los datos e informaciones recopiladas.

Todos los ítems fueron presentados en forma de afirmación, solicitando al estudiantado que indicara su grado de acuerdo utilizando la escala de 1 a 5, siendo 1 en total desacuerdo y 5 en total acuerdo.

El primer ítem era: **“I think that, in general, the courses were useful”**

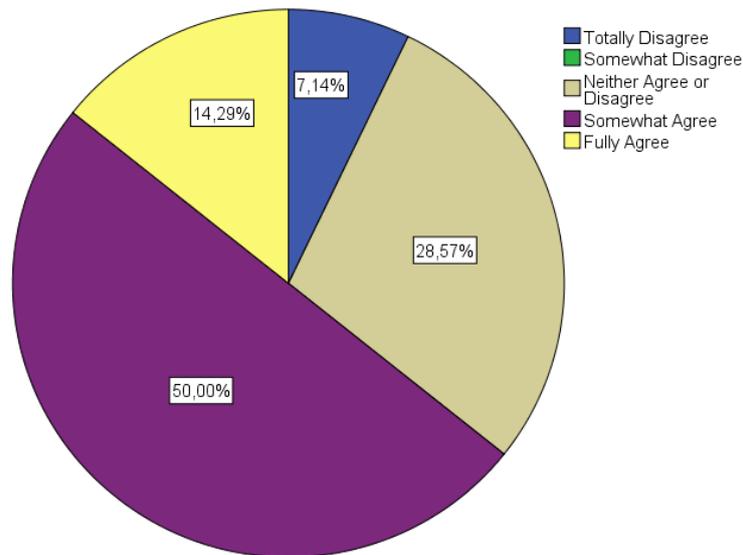


Comentarios cualitativos respecto este primer ítem:

- I expand on this further below but yes, I have found them useful. Maybe not so much in the traditional sense of doing the courses and becoming an expert on the topic. It's been more a journey of discovery and personal understanding on where I should and I wanted to specialize.
- The classes gave us the necessary background to understand the material, but still pushed us to expand on those ideas and think independently. Quicker feedback on our work would have been useful.
- I think that the credits of the seminars subject would be better to use them in other subject. For instance, in data science.
- I think that the content of the courses is totally useful but sometimes not really well delivered.
- There is a lot of difference between the courses offered, for this reason it is hard to find all of them interesting (one student might be more interested in signal processing and another in cardiology but they have to take the same courses).

- Generally speaking, courses were useful. However, I believe that some of them could be a bit more “organized” in the sense that there was a lot of content and not so much time to do it. Moreover, I expected the courses to be a compliment of the master thesis. That is, to be helpful and aid on the development of it thanks to the knowledge acquired from them but in some cases it wasn’t like I expected. Perhaps more organization in terms of master thesis topics and courses would be helpful.
- Courses had many shortcomings related to organization, preparedness and the topics which they covered.
- Theory was very interesting but sometimes I felt it could be more complete, due to evident limitation in time. It could be interesting to do a whole year of only lessons, with continuative subjects; and the half a year for the master thesis.
- In general, the courses were really useful, mostly computational cardiology and complexity science. I found research methodology not really useful.

El segundo ítem recogido en el instrument decía: **“I think that, in general, the courses were well prepared/presented”**.



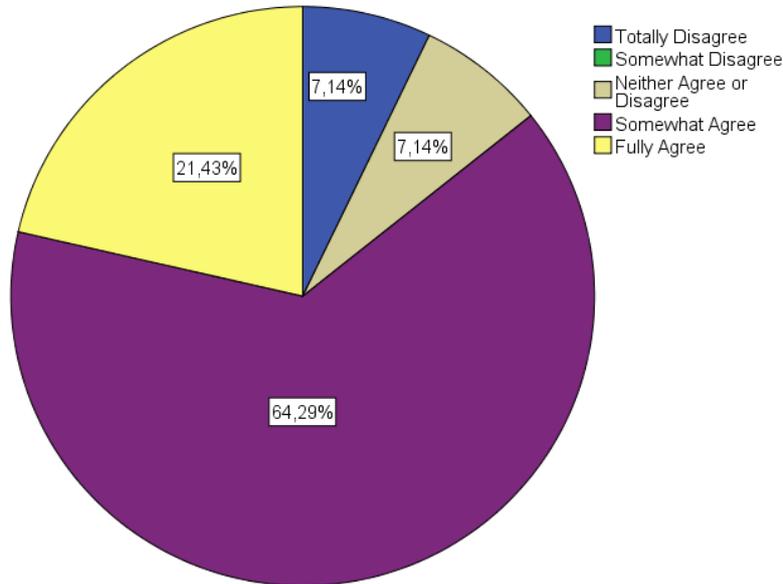
En el caso de este segundo ítem se observan diferencias relevantes en las valoraciones del estudiantado. En el curso 2017-2018 el porcentaje de registros en los valores más altos de acuerdo computan un 64,3% del total, mientras que el curso pasado este porcentaje era del 33,3%, de decir, que se ha prácticamente doblado el nivel de satisfacción con respecto al ítem en cuestión del curso 2016-2017 al 2017-2018.

Comentarios cualitativos:

- It really depended a lot on the course. Some of them were very well prepared, some others didn't yet have a clear idea of where they wanted to go (but still were very interesting), some others did know, but the preparation to reach the objectives wasn't there. In short, the master needs 2 or 3 more years to work out the structure and contents of the subjects, but the contents are interesting.
- Overall, the instructors did well with streamlining the courses to give us good footholds in their subjects. The exception is the Computational Cardiology class, which I felt covered too much material that was not well connected.
- Sometimes, a lot of content was intended to be taught in one theory lesson, and it was explained quickly. Something similar happened with some labs sessions, so that the workload at home was elevated. It would be better if classes were more balanced.
- As mentioned in the previous question, the preparation/ delivery of the courses sometimes make them not as useful as they could be. Specially the Computational Cardiology course and the project of that subject. The most prepared and well presented one was Research Methodologies.
- Some of the courses were perfectly designed, with well explained theory, and practice and seminars that helped to understand it better; however in some of the courses (especially those with more than one teacher) every part of the course felt completely disconnected from the others.
- Some labs could be improved by providing more theoretical concepts that could be applied in the practice sessions and more detailed guidelines about the goals that the students should accomplish.
- It was true in the most of the cases. Nevertheless, things can always be improved and there were some courses in which the organization was not the best one and I felt a bit lost when trying to understand which was the point of doing a certain topic.

- In most of cases, teachers were only able to reach the small subject/field of course topic which related of their research. Having numerous teachers for each course doing the same doesn't centred knowledge of topic without teaching underpinning of topic.
- There are some courses (Teràpies Computacionals) that require more attention. All the first part seemed like a waste of time because we did not use this information. As consequences, the second part has little time to well define the target of the course. I really enjoyed the first two parts and I would have liked to use them further.
- It depends on the subject, but as overall lessons were well prepared and I learnt many new concepts from specialists on the field, however it could be very interesting to go deeper into the topics.
- The classes were very good organized.

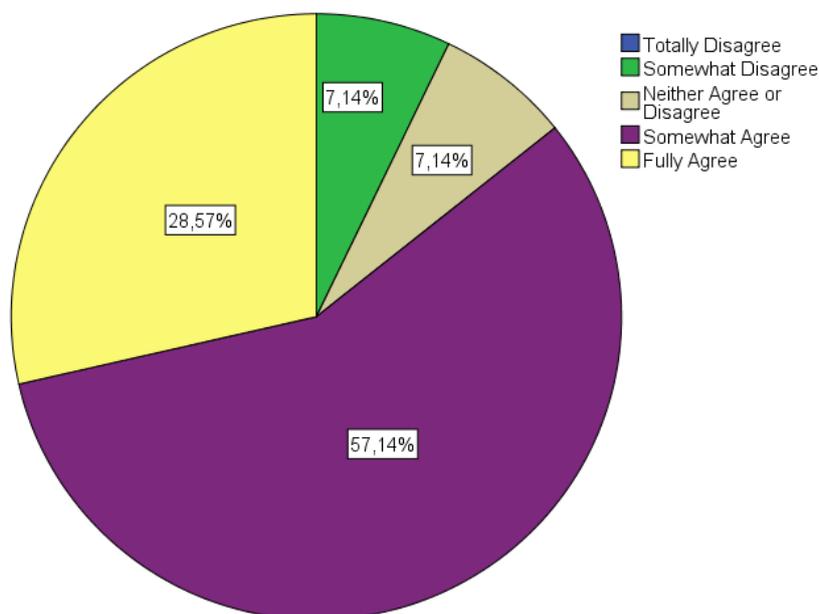
El tercer ítem: **“I think that, in general, the practices/labs, seminars and other educational activities help me to understand the theory worked in lectures”** y los comentarios cualitativos recogidos al respecto aquí:



Comentarios cualitativos:

- The labs generally were direct applications of the lecture material. I had no problem with the structure of the labs, I just wish we had more of them.
- In general it helps me to understand better the theory.
- Again, true in the vast majority of cases. However, there were some laboratories which felt a bit rushed or missed some guidance. I believe that depending on the level of the laboratory guidance is needed to ensure a good comprehension of the theory/practice.
- The practices for courses were largely stolen directly from free online resources without amendment.
- Some courses (Ciència de Dades, Teràpies Computacionals) are completely unbalanced. In one of these theory was completely insufficient or too general to complete the assigned task (I am referring in particular to one part of the subject), the other one had to do too much in too few time, no structure.
- Totally agree, that's why I think that more practices/labs should have been done during the course.
- I had more troubles with data science as I could not understand the theory well.

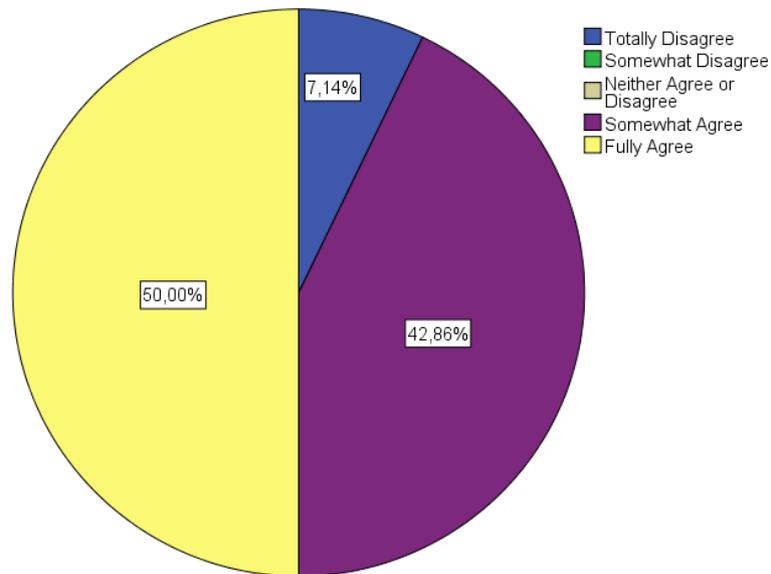
El siguiente ítem **“In general, I think the master was well coordinated”** se distribuye según la respuesta de los participantes de la siguiente manera:



Comentarios cualitativos:

- The overall deadlines for the master (mainly the thesis) were well communicated. The timelines for the individual courses could have been better outlined at the beginning, but we were still well informed of the expectations along the way.
- The coordinator always tries to help us when we had some problem.
- The master coordinator is always willing to receive feedback and improve the Master.
- The master coordinator was very implicated with the master and the students.
- The total amount of work was a little bit excessive if you wanted to achieve all the goals perfectly and make them most of everything you were learning.
- In general, my master had a good coordination. However, as I already mentioned, I would have liked more coordination between the master thesis topics and the focus of the courses.
- Aggressive timeline, excessive time investment required for some courses. Poor communication from master coordinator.
- The coordinator has been the whole year trying to make everything work, since it is evident that this is a new master program and it has to be adjusted. It needs some improvements, but they are achieving it. One of the “complaints” is that we haven’t had a call for master thesis for September, although there was the call when we got enrolled to the master. It could have been very useful for any setback that can appear when doing the master thesis, especially considering that it is oriented to the research field, and that during the course we had little time to develop it.
- I would add an extra chance for presenting the master thesis.
- There were several problems related to seminar schedule sharing with students.

El siguiente ítem del cuestionario decía **“I think that, in general, the academic resources provided during the course (material, labs, equipment) were suitable to support my learning process”**, y la distribución de las respuestas es esta:

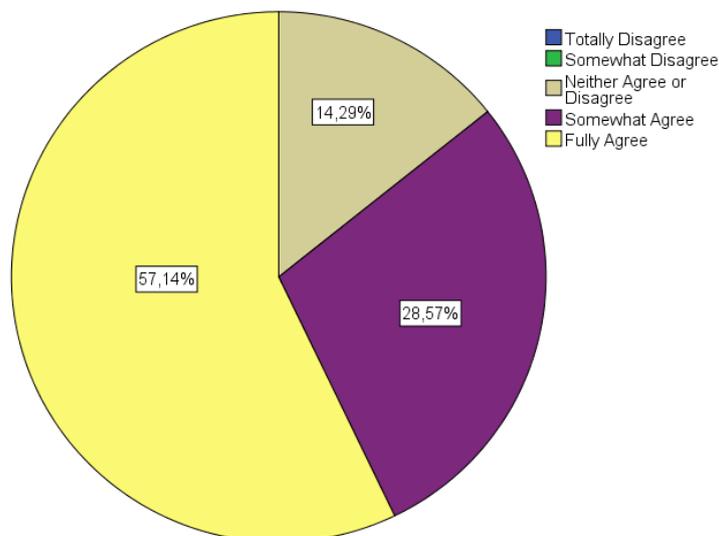


En el caso de este ítem se observan diferencias relevantes en las valoraciones del estudiantado. En el curso 2017-2018 el porcentaje de registros en los valores más altos de acuerdo computan casi un 93% del total, mientras que el curso pasado este porcentaje era del 55,56%, de decir, que la percepción del estudiantado con respecto a la adecuación de los recursos académicos durante el máster para favorecer su proceso de aprendizaje ha incrementado notablemente en el curso 2017-2018.

Comentarios cualitativos:

- The supplementary material we were given was quite nice. The professors were always willing to provide articles directly related to class material.
- The material provided by the university was excellent.
- The academic resources were perfectly suitable.
- I strongly agree with this statement. The only labs in which we needed equipment were really well equipped and we had everything we needed to support our activities.
- The microcontroller course advanced interface design had no resistors. Teachers provided bootleg software incompatible with school version.
- I think the material was suitable for someone prepared for a master.

En cuanto a “I think that, in general, the educational resources by UPF (Library, Aula Global System, etc.) were suitable”:

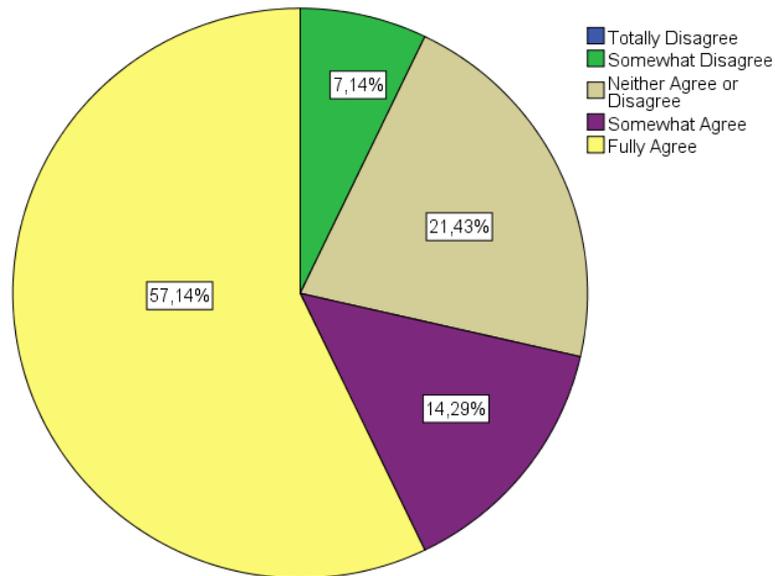


En lo que respecta a los recursos educativos a nivel UPF (biblioteca, Aula Global, etc.) el estudiantado del máster muestra un nivel de satisfacción muy alto, prácticamente un 86% de los participantes ha valorado con los mayores niveles de acuerdo este ítem. En el curso anterior, este mismo porcentaje era del 66,6%, así que en la edición 2017-2018 ha subido un 20%.

Comentarios cualitativos:

- Ciutadella library is amazing!
- To access to guides in the web page of the UPF you needed to go to another link, but sometimes this link was not available.
- The educational resources were also excellent.
- The educational resources were also perfectly suitable.
- In a similar way to the previous question, I also strongly agree with this one. Educational resources were always useful and suitable for the usage of the students.
- This is an English language master's, but many resources are only in Catalan.
- Labs were available for me when required.

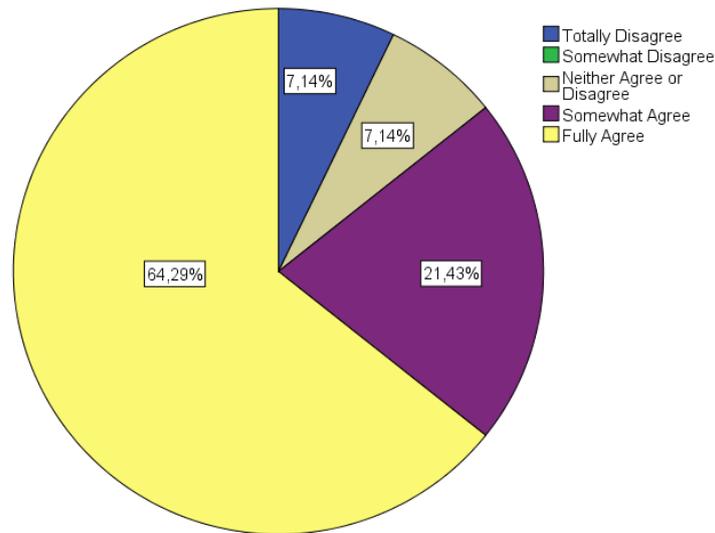
En lo referente a “**In general, I am satisfied with the tutorship advice received before the master started (e.g. in choosing elective courses)**”:



Comentarios cualitativos:

- I had a clear idea of the classes I would take for the whole master's before the school started. I think a useful tip would be that the student should be active in contacting their tutor for this advice.
- I am satisfied with it. However, no subject has been useful in my master thesis.
- Thanks to that advice I have been able to pass the master.
- I don't really agree with this one. In my opinion, one of the things that should be changed in the master is the guidance given before starting the master. In my particular case, no one told me which subjects were the best for my master thesis. Moreover, we lacked information about the subjects on the website of the master and the only one that could be found there was not really useful not provided a “real” description of the subject.
- Good recommendations were made, but schedules were unavailable at time enrolment, causing conflicts.
- [...] helps me a lot.

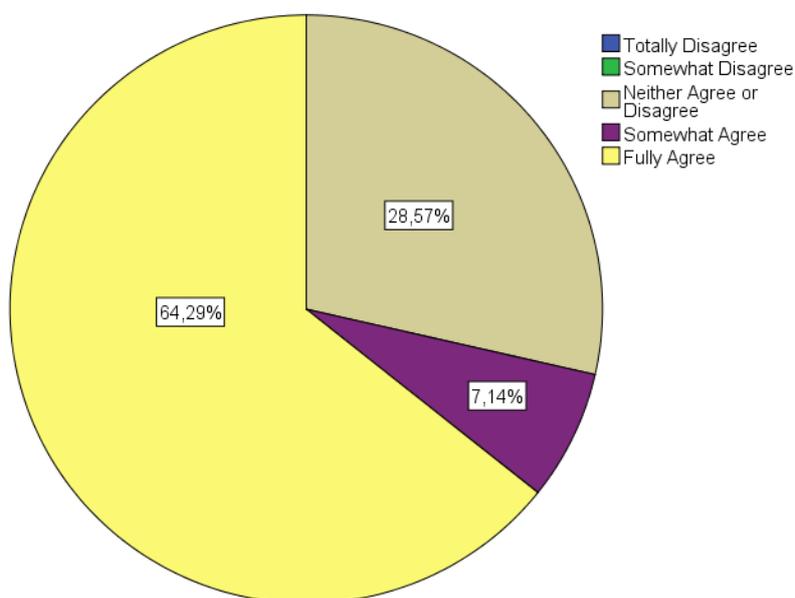
El siguiente **“In general, I am satisfied with the tutorship advice and the support by the master coordinator”**:



Comentarios cualitativos:

- I think he did a very good job overall. He was very approachable and always addressed our concerns. He was accommodating with our requests, but also kept the integrity of the program in mind. My one improvement would be to tie together the classes a bit better.
- I have received help when I did not know how to continue the thesis or when I had doubts.
- The master coordinator was always available and willing to provide help.
- Although we had some misunderstandings, he was helpful. However the communication via email towards the end of the year worsens our relation, making me feel that he was angry at me in very email I received.
- I strongly agree with this one. Generally speaking, our master coordinator has always been supportive and helped us whenever we needed him.
- He communicated poorly with students. He held two feedback sessions during which he spoke the entire time, and never actually listened to feedback.
- All of them help me a lot, always ready for solving any possible problem.

El cuestionario incluía un ítem referente a la percepción de apoyo por parte de la secretaría, aquí la formulación y resultados. There was also an item related with secretariat, concretely it says **“In general, I am satisfied with the support and attention of the secretariat”**.

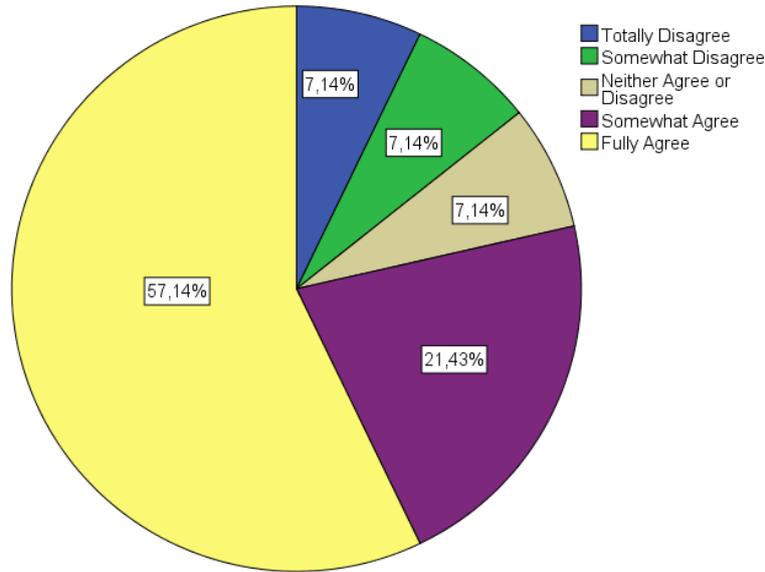


En lo que respecta al grado de acuerdo del estudiantado con respecto al apoyo recibido por la secretaría, cabe decir que el porcentaje de los valores más alto ha pasado de un 44,4% (2016-2017) a un 71,4% en el curso 2017-2018).

Comentarios cualitativos:

- I did not have much interaction with secretariat, but when I did, it went well.
- The secretariat staff was always helpful and provided excellent attention.
- In general the support offered was correct, but I went to the secretariat a couple of times to pick a document for my practicum, which they told me that they had it but it wasn't really there so I had to come another day.
- I didn't need any support other than the electronic resources provided by UPF.
- Same as the previous question. They helped me whenever I had problems in any academic process.
- I needed weekend access and the secretariat pulled it off. No problems.
- Really kind and helpful when required.
- Seminar schedules were very hard to be shared between students despite contacting secretariat.

El último ítem decía **“In general, I am satisfied with the supervision on my master thesis”**, and its results are:



Comentarios cualitativos:

- I'd say it's been a mixed bag. It's has been definitely been helpful in many aspects but in some others, such as review feedback not so much. This is totally on a case by case basis, and in mine, I understand that basically the thesis did not align with my supervisor current objectives at the time. Since supervisors are overworked, there is only so much time they can allocate, so it happens. Maybe it would actually be better to decrease the number of offered topics to match more closely the interests of the supervisors, mostly to pool efforts on the same direction.
- My supervisor was very good, and we had an effective working relationship. I was pushed to think in new ways, and I was shown how to effectively present my findings.
- My supervisor provided my excellent assistance during the realization of the master thesis.
- The supervisors of my master thesis gave me always feedback and all the tools that I needed to carry my project.
- The supervision was correct. We've had meeting with the supervisors and the rest of the group in a regular basis and received feedback whenever I was necessary. Moreover, there were some events organized for the project in which some clinicians attended. They were really useful for us in order to have other points of view about the project.
- My advisor spent most of the time in other countries, and my co-advisor spent the last two months in USA. We met a total of 6 times to discuss my project.
- I would like have liked to have just a little bit more attention in the final period (more support answering on time, giving more information). But all the professors were very well prepared, kind and truly passionate in their work.
- Not all the supervisors were in the same conditions to help their students. Some of them had a lot of students in comparison to others and other work to do, and the time dedicated to their respective students was not equitable. It could be interesting to have other deadlines before the final deadline, not only controlled by the tutor of the master thesis but the coordinator or a thesis committee.
- This helped me to make a better thesis.

En formato de pregunta abierta se les pidió que indicaran **what they liked the most and the least** del máster (**most, least**), y las respuestas, según el caso, fueron las siguientes:

- The **most**: I like the degree of specialization of the master. I found very rewarding to be able to attend to meeting of the research topics and has provided me with knowledge and experience. The subjects also gave me tools that I will for sure use in my future, such as data science. There were also more specialized subjects but I still found those interesting. The think that I like the **least** was the timing of subjects and master thesis. There is much work from the subjects and it is difficult to work on your thesis from the very begging.
- The **most**: The master has been a very good way to explore topics I wasn't familiar with and understand which of them benefit most from my previous skillset. In regards on how to transition from a purely technical background onto the biomedical domain, I'd consider it a success. As per **negatives**, there was quite a bit of tisparity in course load between subjects and the supervision on the thesis has been lacking at times. Not to say I haven't enjoyed the freedom this has provided but, with a bit more structured, the learning process could've been more efficient.
- The **most**: I really enjoyed the class material of the master's. I feel learned a lot of useful concepts, and I was challenged to think independently to apply those concepts. I have been shown a lot of useful tools, and I can see a lot of ways I can use them. One of the **drawbacks** was the lack of feedback during the courses. I would have like to know how I was doing in classes before the finals. It can be unsettling to not know what you are doing wrong.
- The **most**: the possibility of being working in a research project inside the research group when developing the master thesis. The **least**: it is supposed that the theory lessons are oriented to help students in the realization of the final thesis project. However, at least in my case, no classes have helped me with that. Moreover, in some subjects the workload was too much that we cannot dedicate time to the thesis development.
- What I liked the **most** of the master is the realization of the Master Thesis and the material provided by the University and the research group to perform it. Regarding the courses, I particularly enjoyed Computational Therapies even though it was not entirely well organized. The **worst** part of the master is that some courses were poorly organized, and this made them not as useful as they could be. I also didn't like the fact that there wasn't the possibility of delivering the thesis in September/October since the workload of the subjects was high and sometimes hard to do it all or required less dedication to either one thing or another.
- The **most**: The master was well coordinated, and I found some of the courses very interesting. The **least**: I found half of the courses not useful for my formation.
- The **most**: I enjoyed the fact that you could choose so many courses, on one side, and that the master thesis was so relevant on the other. Maybe I would have appreciated more thoughtful teachers in some courses. In general I am more than satisfied with the master and pleasing to have coursed it.
- In my opinion, the **best thing** about the master was the commitment to research. The master thesis is the most important thing of the master and in my case, I really felt like I was part of the research group since the start of the project. Also, the quality standard of the thesis is high, meaning that you need to put a lot of effort in order to achieve it. On the other hand (the **least**) as already mentioned, I expected to have a better linkage between the subjects and the master thesis. I know that the master is relatively new so it's comprehensible to have this kind of things. In any case, I'd liked to learn more specific things from the subjects, which in my opinion, were necessary.
- The **most**: My project was really cool and engaging for me. I was no better of coming to UPF, that taking course online in terms of academic support however (the **least**) Universality participation in independence protest cost me a third of my classes the first semester. That is absurd.

- The **most**: structure, services, kindness, professor's humbleness and preparation. In the end I really enjoyed the master. The **least**: I expected much more computational things (like Bioelectromagnetisme Computational). Too much programmer skills required.
- The **most** I liked about the master is the overall guidance and proximity of all the professionals in the university, which provides the opportunity to easily get in contact with the work of others and become involved in real research. The **least** I liked was the fact that we went through subjects only superficially because of the lack of time.
- I liked the **most** the working environment of the COMPILAAO group.
- The **most**: I helped me learn and understand techniques with implications in a wide range of areas. The **worst** thing is that it was a nightmare to get into the seminar schedule mailing list.

Y por último se les pidió que nos comentaras cuáles era sus perspectivas/intenciones una vez finalizado el máster: **“Which are your professional perspectives/intentions after finishing the master? (Do another master, continue your academic career with the PhD, work in a company, you don’t know...).** **Please, explain us your answer.**

- I will look for a job in the private sector.
- I’m working out the details for a PhD although, at the end of the day, whether or not I fully commit to academia will be a balance between being able to work on interesting problems and the ability to finance myself. Another opinion I’m considering is the research assistant path, and basically works on research providing mostly tech assistance to enable researcher to train and deploy their models.
- I will be a research assistant at the PRBB.
- Do another master or pursue an academic career as researcher.
- Since I have been studying for a long time, I am thinking in starting to work in a company or something similar, but I do not discard to continue my studies doing another master or a PhD in a future.
- After finish the master I would like to work in a company. First of all because I have been studding a lot of years in a row and I would like to start working. The economic conditions of the PhD’s are also a factor since they are not usually really good, and I would need to receive a scholarship. Finally, I believe that in case I did a PhD I would need more experience in the chosen field.
- I would like to continue my academic careers with a PhD if I can find one where my profile could fit.
- I was already doing a PhD when I enrolled in the master so now I intend to finish those studies.
- My intention since the start of the master was to continue with academic careers with a PhD. I have already been accepted into one PhD program (abroad) and I believe the master helped me achieving my objective. The reason behind continuing into the academic world is simply because I enjoy doing research and learning new things.
- Work in industry. This experience has pushed me away from academia.
- I would like to work in a company or in a Hospital, but this master gave me us all and nothing. I don’t know in what we are prepared for. I would appreciate more suggestions in this.
- I am already working in a company where they have offered me to do a PhD. I have also been offered other PhD projects, so my idea is to decide which is the one that interests me the most, not only on the issue but also on the supervisors, the group and futures prospects, and continue with that.
- I would like to work in a company or try to get involved in an industrial PhD.
- I aim to develop my career working in a company. As this master approached me to research (PhD path) I understood that it comes with an unsure lifestyle. Given the investments of my country on research I prefer to work in a company being unable to decide what to work in exchange for having more stability.

Conclusiones

Los resultados de la evaluación muestran un nivel de satisfacción global por parte de los estudiantes positivo en todos los temas incluidos en la misma, de hecho se han observado y apuntado en el documento los casos en los que el nivel de satisfacción es representativamente diferente al obtenido el curso pasado (2016-2017) siendo la tendencia de esta diferencia en todos los casos, hacia un nivel aún mayor de satisfacción.

Animamos a la coordinación y profesorado a leer atentamente este documento y a reflexionar sobre los resultados obtenidos para seguir trabajando con el objetivo de alcanzar una mejora continua en cuanto a la calidad de la formación.

La Unidad de Apoyo a la Calidad y la Innovación en la Enseñanza (USQUID) ofrece su ayuda en caso de que los coordinadores y/o profesores deseen llevar a cabo cualquier acción relacionada con la calidad/innovación.