

**Dear fellow Computer Science teachers,**

My name is George Chaaya, I moved to the Netherlands to start a PhD in Computer Science Education at Radboud University – Nijmegen. I would greatly appreciate if you read the rest of this document, and I would be delighted if you decide to help me with my research.

### ***Professional Background***

I am a Computer and Communication Engineer, worked for three years as a Managed Services Engineer, I pursued a Master degree in Computer Science and then did research for three years in the field of Recommender Systems (Artificial Intelligence). I taught CS for 10 years, mostly in Notre Dame University in Lebanon (around 15 different computer science courses), and in another university and school for a shorter period, I also taught CS in an international school in Cyprus and in different elementary schools and coding schools in the USA, UK, and China (online).



### ***Short Summary of the Project***

Design-based learning is an instructional approach often used in the teaching of computer science and programming in secondary schools, where students work in teams to produce games, websites, applications, and others. Teachers face some difficulties during a design-based lesson, and one of them is the assessment of students' conceptual understanding. Formative assessment is not only about what teachers do, but what they "see". That's why teachers' **noticing** plays a major role in such sessions, and it is the driver of teachers' actions. Teachers' noticing was studied in the past decade in mathematics and science education, but to the best of our knowledge, no studies in computer science education addressed it explicitly, and especially in a design context.

The purpose of the research is to understand the following: what teachers notice in both students' design work and the discussions they have within their teams, the different factors that affect their noticing, how they interpret the events they notice, how they respond to them, and the effect of their noticing on students' learning. The end goal would be to create a framework/principles on noticing in CS, that will facilitate teachers' work during design-based programming sessions, and that will help them improve their noticing and responsiveness. The main question I aim to answer is: How can we characterize the noticing/interpreting and acting of computer science teachers during design-based programming sessions, and how can we improve them to have a more efficient formative assessment of students' conceptual understanding?

### ***What is requested from teachers***

The plan of the research project is still under development, but I will mention briefly what could be needed from teachers willing to participate and provide their knowledge and expertise to this research:

- 1- As a start, an informal discussion to have an idea about the design practices they use in their classrooms, and hopefully the possibility to attend one of their classes and observe how things go.
- 2- For the first study I am planning, the participation would require answering some questions (probably written) about a certain design artefact (from a teachers' noticing perspective), along with a short interview afterwards to further elaborate the ideas.
- 3- For later studies, and for those who are interested in going more in depth in the study of noticing, they will be either provided with teaching materials, or they will come up with their own contexts that we can adjust together. An in-class observation will take place (session recorded), followed by an interview to reflect with the teachers on some specific moments during their instruction.

The study will be mainly conducted in secondary education (any level). Unfortunately, the Dutch language is still a barrier for now, that is why for the in-class observation part I am trying to work together with teachers who teach CS in English, whether in international schools or in bilingual Dutch schools. For the first part of the study that will be done outside of the classroom, the language will not be an issue.

### ***What next?***

If you feel interested in this research, if you would like to know more about it or be part of it, I would be very happy to meet you and discuss details with you. You can reach me by e-mail: [georges.chaaya@ru.nl](mailto:georges.chaaya@ru.nl)

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*Thank you for taking the time to read this document, and for any help you can provide.*