Constructivism is a view of learning that involves individual and social construction of knowledge in personally meaningful contexts. Science in particular can easily lend itself to the constructivist method of teaching and learning because of its applicability to everyday circumstances. Chia and Chin investigated what inspired student questions, and what kinds of questions do students ask individually and collaboratively during constructivist investigations (2004). After analyzing the student generated questions, they came to several conclusions. Firstly, when students generated questions on their own, the majority of those questions were “inspired by factors external to the school” and “formed a large proportion of the higher-order thinking questions” (Chia & Chin, 2004, p.721). Secondly, when students generated questions in a collaborative setting, different categories of questions led to different types of knowledge construction (basic factual, linking concepts, application, evaluative, etc). Lastly, during collaborative problem solving, “the importance of asking the ‘right’ questions” became very vital in maintaining the momentum and motivation of the students (Chia & Chin, 2004, p.723).

The study took place in a ninth grade biology class in Singapore where the unit topic was “Food and Nutrition”. There were 39 students, all girls, who worked in heterogeneous groups of four to five according to ability level. Each group worked on a topic of their choice related to the unit theme. Students were given one period per week to work on their projects and the study took 18 weeks. In analyzing the methods of this
study, I find it hard to ignore the uniformity of gender. The study doesn’t address how all girl groups impact the collaborative setting where students must discuss, come to conclusions and formulate plants to investigate their topics. How can they ignore the dynamics of gender in a social setting?

The second unaddressed inconsistency is the topic of the student projects – “Food and Nutrition”. Chia and Chin discussed the one group that was frustrated and slow to move forward due to their inaccurate questions that led them to dead ends in their research (2004). This only happened to a single group, yet the authors fail to discuss how it could be a much more prevalent problem had the topic been something less familiar than “Food and Nutrition”. How can students ask questions and “construct” knowledge about something completely foreign without much teacher guidance? Chia and Chin mentioned that those groups who were having a hard time needed a teacher to intervene, yet they also repeatedly stressed the importance of student generated questions, investigations and conclusions (2004). The balance that must be struck between independent student knowledge construction, including the discovery of misconception, and the role of the teacher in guiding those students should be explored more thoroughly.

Chia and Chin asserted that an “implication for educational practice is that students learn better when syllabus content is related to real-life issues that they can identify with” (Chia & Chin, 2004, p.721) However they do not present any evidence that links the types of questions students generated to student achievement. In fact, they only give participation percentages to infer that motivation had increased. Just because students are generating higher thinking order questions, doesn’t mean that students are
learning better. There was no data on student achievement, this wasn’t the focus of their study and seems out of place.

As far as applying this to my own classroom, I am curious to try gender uniform groups as well as exploring what that balance is between student autonomy and guided inquiry. I am impressed at the depth of student motivation presented in the article; however, the setting is too different from my own classroom. I am not sure how open inquiry can yield student constructed knowledge that corresponds to the sometimes very tedious standards that we must teach our students. Yet, I recognize that students are far more likely to retain knowledge that is meaningful to their personal lives.
References