1. Traditional approach and why this approach is difficult for students to learn a new language

Computer programming is no longer just a skill for the few, but is being taught and absorbed in mass, since its application is nearly in every field or career path a student may go towards. One fact that was taught to us as a student, was that once the material is written into books for us to learn, it is already outdated. Combining this with the fact, that course material is based on textbooks that were published perhaps a few years ago with perhaps some small updates here and there is not really building on a student’s motivation or their confidence in learning.

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Traditional approach is a system or method of teaching that is like the mass production of teaching. You have a fixed syllabus from a textbook, and the teacher will teach the students from the basics, and have certain parts be memorized and quizzed upon. Though over the years, even using the traditional approach, IT courses do have some elements of interaction, like a practical coding exam (either closed book or open book), there is still a somewhat fundamental issue with this style. As a student, many of my professors said one thing in common. Once the textbook is written, this is already outdated. Perhaps for an introductory first programming class, a heavy emphasis on memorization and basics is necessary, but when taking a secondary language, another emphasis on memorization will not benefit a student.

Re-learning another language, knowing that what they learn is outdated is not the most motivating mindset to have. A student should only learn the basics like the following once:

What is a variable Different data types

Data structures Conditional arguments (If statements)

Loops Methods or functions

Object Oriented Programming (Class structures)

If the core concepts are understood, a student should understand that in the real world, we are thrown into the ocean with sharks, and not trained into it at times. Meaning, that if you know the basics, you should learn to apply it, regardless of the programming language.

1. What is project-based learning and why is it beneficial

Project-based learning is different in the sense, that one is not tied down by textbooks and outdated concepts. A student with the help of an instructor can help design their own learning emphasis using the latest packages and modules available on the internet. These projects are much more interactive for the student, since they can choose something they are interested in. This could perhaps be a UI design style, or maybe creating some web app or mobile app. This component of choice in the early stages of learning programming is vital, since this will help develop their interests in something they chose, while teaching them how to research and fulfil their goals.

The cheerful side aside, project-based learning is more practical as a student has a rough idea of what their goals for the course is, or why they need to learn certain skills. Learning has been known to be more efficient when the person learning knows the how, why and where the knowledge can be applied. Basically speaking, the more you practice, the more imprinted the information gets, thus, when you are learning a skill to use, you practice it more than learning for the sake of knowing.

1. Difficulties of using java on a project-based learning setting

Though java is a high-level programming language, it is a very powerful programming language that has laid its roots strongly in several areas, thus being called a general-purpose programming language. The issue with using Java for a project-based learning, is that it is still somewhat a sticky language to spend time learning all its quirks and syntax, to be able to use it to create anything more than an executable file for a desktop.

There is no issues with creating an executable file, or perhaps trying to learn to use Java to create your first web app project, but teaching a student with something they can see results faster is always more motivating in learning, than something where they won’t see results till they are half-way into a semester. Kotlin was designed on Java to help make it more concise (roughly 40% cut in number of lines of code), and make it more user friendly. Best of all, you can easily call Java code from Kotlin, and vice-versa.

1. Why Kotlin is more suitable for project-based learning

First of all, just considering the compatibility of Kotlin with Java, and vice-versa, why not pick the language that is simpler to code with? Though Kotlin was only first released back in 2016, it is rising in popularity mainly for creating Android Apps. Though, it can also be used to develop server-side and client-side web applications as well.

Other than that, we can also take into consideration that it is free to publish an Android App on the google play store, it seems much more reasonable for a student’s portfolio than paying for a web host (which is also relatively cheap), but with a combination of github and an app on the play store, it seems like a good start to a student’s software development career.

1. What are you proposing in this paper and justify how this will benefit student learning?

The proposal in this paper, is the suggestion of creating a project-based study plan for students who have taken that first step in programming. Students desiring to go towards a development role, wishing to learn a second language, could utilize this style of course to learn a second programming language such as Kotlin, which they can build upon as they go through several other courses over the time as a student. Since the student has already taken the fundamental (such as python), then can jump into this course to showcase their ability to learn a language in a practical way to not only create an app, but also over time, they can build upon the art of creating applications as they learn more about database and servers as they continue their time as an IT student.

Project-based learning:

Why is this easier for students, and what skills will they learn and how will that impact them.

1. Build up their resume
2. Enable them to learn some programming skills and work on real projects

Tutorial:  
describe the flow of the tutorial along with the rational

Diagram of the flow and skills learn at each stage of the flow

* Quiz on each section of the tutorial so that the answer of the quiz will help populate the UI or create the class?

(a teaching module followed by a quiz that will help guide the student in learning the skills for each section)

* Creating a list of acquired skills per task completed.