Criterion A - Planning

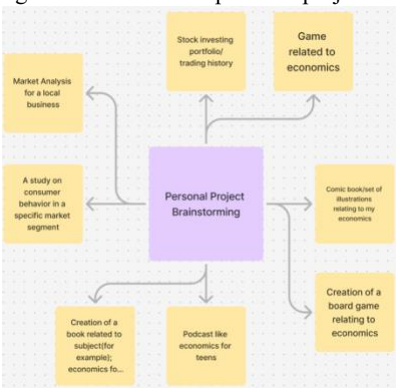
Strand i - Learning Goal

Learning goal and Personal interest:

My learning goal is to **"learn how to completely develop a game with everything from coding the mechanics in the game, to producing the art, soundtracks and more while incorporating elements of economics into them, to both enhance my coding skills and, in an attempt to work towards making education more interactive." .**

I decided to base my project on this topic both, because of my personal liking towards computer science, and economics. I had informally interviewed my friends and found that many of my peers found that education could be more interactive and teaching methods could improve to fit modern society. Since I had a general interest in programming systems, I decided to choose to develop a game specifically since I myself was a frequent game consumer. That would help me keep my game up to a formidable standard that I as a consumer expect from other videogames.

Fig A1- Brainstorm of personal project ideas



Through this project, I hope to enhance my understanding of programming relatively larger systems and video game design, and to spur a change in the way subjects are being thought in schools so that future generations can have a more suited education system for them. I hope that my game can grow to be utilized by students, a wider community, in real time and hope that it has a positive impact on their understanding of economics. I would also like for it to reach a level of quality eventually such that students and parents alike are able to advocate for the idea.

I hope to reach a formidable level of knowledge upon coding/programming and designing videogames by the end of the project. This includes learning a completely new programming language such as C , C++ or GdScript to a high level. I will also need to learn how to use graphic design software to create sprites for my game or edit licensed sprites, meanwhile for audio I will have to learn to use an audio editing software like GarageBand. I also hope to enhance my research skills as they will be required for finding good quality assets (for inspiration or to implement in my game), learning resources, for any bugs I face and etc., which at first is quite challenging. I will also have to learn the art of storytelling and designing so that I can create a storyline for my gaming, this is something that is not particularly my strong suit.

Link to Global Context

I decided to implement the global context, **Scientific and Technical Innovation**, focusing on the area on the innovation of a new game. I figured this Global Context would be ideal for my project since completely designing and programming a new game from scratch is essentially innovation and to some extent creating/attempting to popularize a new form of education which could also be considered innovation. The project requires me to learn about all the different aspects of the creation of a videogame making me learn the technical side of things in terms of game development prior to which I only had knowledge on from consumption of these video games. This includes learning a lot about things thought in computer science, a science field that is currently very relevant. The global context helped me set a clear goal of learning the technical side of videogames, somewhat innovating a new educational concept and a completely new videogame.

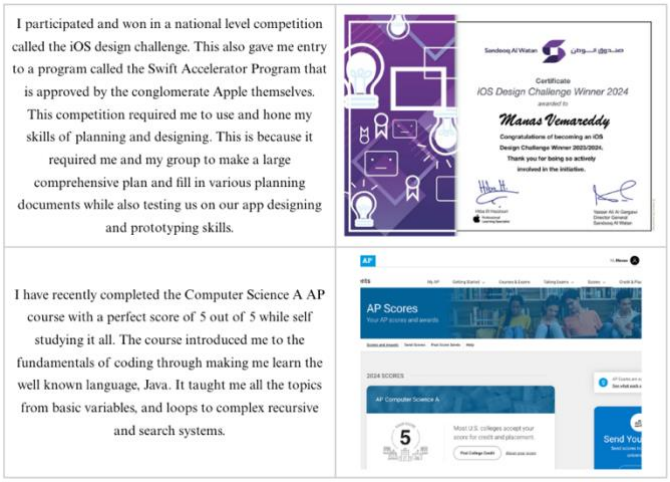
Alternate Global Contexts would have made me view my project in different perspectives. For example, Fairness and Development, it would make me view my project in a way where more importance is given to the development of a new interactive and modern way of teaching. Else if the chosen global context was Globalization and Sustainability, my video game might focus and make use of real-world trends of globalization and maybe even focus on how changes in the environmental laws for more sustainability could affect economies.

Why my goal is challenging for me

My goal is highly challenging for me because I have to plan, design and program a videogame, which are all mostly new skills. While I do have previous experience in coding, it has only ever been in web design or

very basic use cases while in terms of the other aspects such as art and sound design/compilation I have comparatively little to no experience. Other reasons my goal is highly challenging have to do with the general complexity of a videogame and its extra intentions, for instance, my videogame must be able to implement aspects of economics into it. The videogame also must be enticing and fun while incorporating education. This also leads to another reason why it may be challenging for me. Making the videogame fun increases in difficulty as elements of education also need to be implemented. So a good balance has to be found over entertaining and educational aspects such that the consumers of my game continue to play my game with similar play time to any other purely entertainment oriented video game so that it can have its full effect.

Fig A2 – Information on prior knowledge



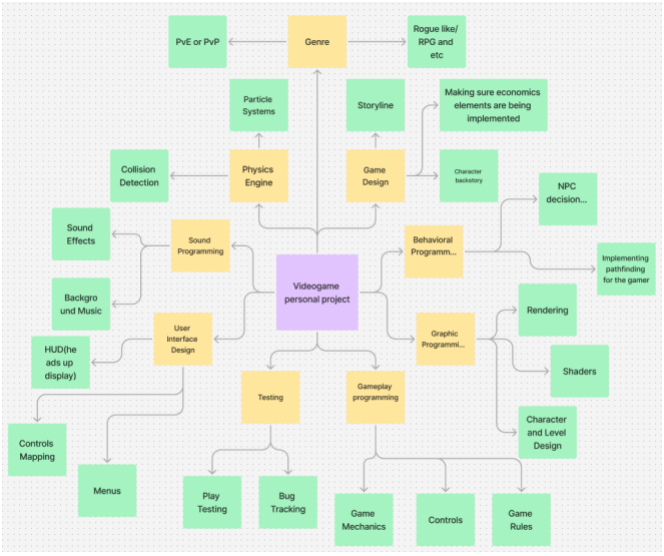
Prior Knowledge

Prior to this project I have had experience in both coding and economics side of things. I have learnt multiple programming languages including HTML, Java and Python. I have also completed the AP Computer Science A exam which requires Java knowledge and won an iOS design competition as shown in figure A2. In terms of Economics, I took the subject offered in the school and participated in a case competition in the past while also performing demo trading on and off as a hobby. In terms of sound design I have none but for the art side of things, I used to pursue art as a hobby at a younger age(around 12-13).

Strand ii – Product goal

My product goal in short would be to **"Complete the creation of a fun 2D platformer videogame that successfully incorporates elements of economics into it with a minimum of 3 levels"**

Fig A3 – Brainstorm of what a videogame personal project would consist of to get an ideas of what my goals should be



The game aims to put an emphasis on education intertwined with entertainment. The genre of the game would be a platformer game, a platformer game is a game in which the player must control the main character between different platforms and finally reach a goal. These games are often found to have smooth and fluid movement systems and gameplay is centered around that feature. My game will be 2 dimensional, this is because a 3-dimensional game would introduce many more factors when considering both graphic design and coding alike and it would increase the difficulty by a substantial amount in comparison to a 2D game and can lead to the overall game being of worse quality since I personally have less experience with 3D programming and design and in general seems less feasible for the time frame. Overall, the product aims to be a fun and entertaining 2D game with great movement physics and storyline progression with elements of economics. Figure A3 shows a brainstorm of factors that will be considered when producing the videogame. In terms of the economics element, the game is going to be linked with the basic concepts of market demand and supply. This is because these are quite simple topics that are also easy to understand by people of different cognitive abilities and ages. It is also one of the most important concepts in all of economies and works as the baseline for all other concepts.

I got the idea of creating a video game relating to economics primarily from my interest in coding and programming and decided to add an extra challenge / use case for my product by creating the connection to economics due to the possibility of myself pursuing finance in the future. In terms of pure game design I had

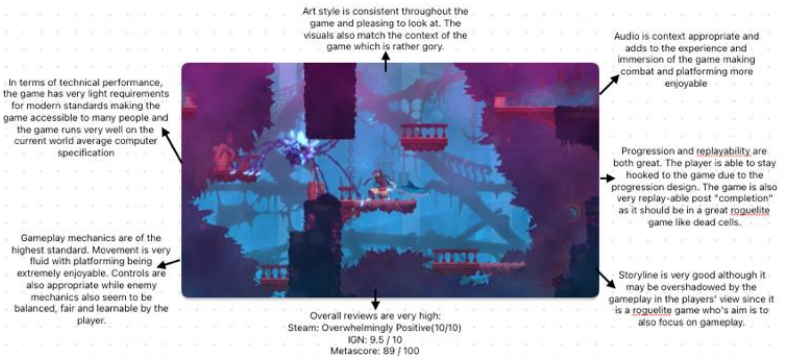
got inspiration from games like Dead Cells a 2D platformer and Hades a 2D roguelike. The games are heavily praised for their gameplay and movement, storylines, soundtracks and character design which I have Analyzed in Figures A4 and A5. I analyzed these to find what made them so successful so that I could add those points to my success criteria.

Link between my learning and product goal



Fig A4 – Brief analysis of the game Hades

Fig A5 – Brief analysis of the game Dead Cells



My learning goal, "**To learn how to completely develop a game with everything from coding the mechanics in the game, to creating the art, soundtracks and more while incorporating elements of economics into it"** directly relates to my product goal **"Completing the creation of a fun 2D platformer videogame that successfully incorporates elements of economics into it with a minimum of 3 levels.".** The learning goal focuses upon the acquisition of the skills necessary to develop the complete video game. This also includes honing my skills in aspects such as coding the mechanics, producing digital art, composing soundtracks all while also understanding how to integrate economic principles. The product goal works as a culmination of what I would learn through my learning journey, which would be to end up with a fun and complete 2D platformer videogame that successfully incorporate elements of economics into it. My product goal requires me to reach my learning goals and sets a proper larger target for my learning path.

Producing the Success Criteria:

At an early stage itself I started using my research skills to figure out the main steps /requirements required to create my product at a high level. The research was done to create an effective success criterion to assess my product against, towards the end of the project. Establishing clear, measurable, and realistic success criteria can help effectively achieve goals, increase optimization and more (*Awork*). Firstly, I had analysed two games that are similar to the game I plan on creating and those I have played, Dead Cells (Fig A5) and Hades (Fig A4). Secondly, I did some research online to create the different main criteria of my success criterion as shown below where I briefly explain the main 5 criteria. The final strands were chosen and justified based on both research, past experience and the analysis I had done.

Brief Analysis:

Gameplay Mechanics: Refers to the way the game works, the movement, physics, rules, elements and processes that make up a game. They can define the positives and negatives in the game. Better game mechanics helps with flow, motivation, user experience, player progression among others (*Juego Studio, 2024*). There are also multiple types of game mechanics. Game mechanics in general are a fundamental factor in the quality of a videogame.

Art and Design: Refers to the way the game may look in terms of the art style of the characters, objects and environment. The art and design of a videogame always strikes the game player first and can vouch for that as a player for myself, it can also work towards the entertainment levels of the game. A honors theses directly states "Art styles in video games are important because if a style is not executed properly, it could lead to the game's overall detriment in some way", (*Sarver, 2021*). Art style done wrong can also cause the player to be left confused.

Sound and Music: Refers to the auditory factors throughout the videogames. These include background music, sound effects etc. The sound and music can help set the mood, atmosphere and ambience, cause a emotional trigger, cause gameplay feedback (for example helping players recognize challenges) among others (*Juego Studio, 2023*).

Technical Performance: Refers to the direct performance of the video game. It also refers to the level of optimization, the more optimized a game, the better it runs on lower and lower spec computers. Henceforth a. lower optimization level means the game is less accessible. A source states, "A game that has gone through the proper process of optimization will deliver a clear and enjoyable visual experience regardless of the level of graphical settings."(*Paul Collins, 2023*).

Incorporation of Economics Elements: Refers to the direct implementation of economics elements both directly and indirectly. It aims to measure the quality and quantity of economic elements. The quality will also be judged based on the impact of the economics elements on entertainment and education levels of the videogame.

Strand by strand analysis:

Criteria	Justification of the importance of strands based on research and also past experiences
Gameplay mechanics	**Strand i:** From past experience of videogaming I myself know that proper controls are essential to making the game "playable", without proper controls it is unenjoyable to even do basic things in the game while completely disregarding anything else. Precise and intuitive game controls enhance gameplay and can increase a player's immersion in the game. (Apple) **Strand ii:** Movement has always been a key factor in making platformer games fun. By playing games like Ori and the blind forest and Hollow Knight, I myself know that fluidity and naturality of a movement system play a large role in making the game fun. "If the movement mechanics are inherently fun then players will get a lot more enjoyment out of your game." (Rempton Games) **Strand iii:** Progression plays a large part in any game, after getting hooked to the game the progression is what keeps players hooked, it keeps players wanting more and is very important in player retention.
Art and Design	**Strand i:** A cohesive art style enhances the overall aesthetic of a game, attracting players into the game's world. Visually appealing designs can create a memorable experience in players' heads and elevate the mental impact of gameplay. A consistent art style helps the audience understand the game, conflicting art styles can lead to conflicted ideas being perceived. (Steiner) **Strand ii:** An intuitive user interface (UI) helps facilitate menu navigation and gameplay mechanic comprehension. A well-designed UI enhances the overall gaming experience by freeing gamers from the burden of figuring out how to navigate between the games options or having to search up video game controls because they could not find them. **Strand iii:** Richly detailed designs enhance the immersive experience of the game. A blog on a design college's website writes, "The strategic use of game art not only enhances the storytelling but also triggers specific emotional responses that can align with the game's narrative" (RMCAD)
Sound and Music	**Strand i:** Well-written and appropriate background music is essential to increasing the depth of any game. The overall ambiance present in the game becomes more immersive and good, tailored background music also works towards the cohesion between all elements. Background music allows player to form a richer mental image of the game and makes its environment more authentic (Garcia). **Strand ii:** Players can better understand what is going on in the game, in terms of the environment, actions and etc., and have a more enjoyable overall experience with clear sound effects. Players can be guided, and interactions can feel more significant with the use of effective auditory signals. Sound effects play a critical role in providing real-time feedback to actions done inside of videogame (Our Culture Mag & Partners)
Technical Performance	**Strand i:** A stable gaming experience with few bugs and crashes is essential. When a game works well, it lets players participate completely and uninterrupted. With bugs and crashes players are constantly interrupted having to search for fixes or restart the game leading to a general increase in frustration and decline in interest. **Strand ii:** Quick loading times aid in maintaining immersion and flow in gameplay. When players can transition seamlessly between scenes, it keeps the game enjoyable. In general, too, long amounts of loading times are highly frowned upon. In fact, a mobile game developer, Mind fig wrote "A smooth and fast load time enhances the overall user experience, making players more likely to continue playing and return in the future." in a blog (Mindfig studios) **Strand iii:** Making a game compatible with a variety of hardware makes it possible for more players to enjoy the game with equitable immersive experiences (Level Access). An accessible game with low hardware requirements, expands its player base and boosts the number of players. This can be achieved through effective optimization.
Incorporation of economics elements(IEE)	**Strand i:** In an economics related game like planned, the actual number of economic elements implemented throughout the game will be important. It is partly a measure of how in depth the game has gone with its link to economics. The number also cannot be too high or too low, too high would cause the game to be too educational and not as fun, too low would completely contradict the purpose of the game rendering the project a failure in terms of its original goal. **Strand ii:** Additionally, the real quality of these economic elements is extremely important since it is a direct measure of the detail the game goes into. The elements have to be off relevance in today's time and have to be simple enough for younger demographics. This is important in an economics driven videogame.

Success Criteria/ Levels	Gameplay Mechanics	Art and Design	Sound and Music	Technical Performance	Incorporation of Economics Elements(IEE)
0	None of the criteria below are met	None of the criteria below are met	None of the criteria below are met	None of the criteria below are met	None of the criteria below are met

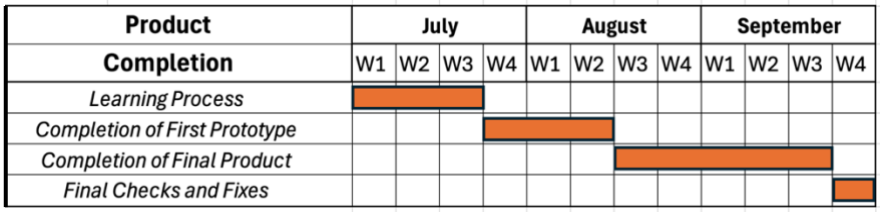
1-2	i. Controls are very unintuitive and not responsive ii. Movement is basic and not fluid iii. Progression is confusing or non-existent	i. Art style is inconsistent and unappealing. ii. UI is not user friendly and is confusing. iii. Character and environment design lack detail.	i. Background music is very distracting and not fitting ii. Sound effects are unclear and inappropriate	i. The game frequently crashes and has many bugs ii. Loading times are very long iii. Very low optimization (struggles on average spec computer)	i. Very few economic elements are implemented (1-2 elements). ii. Economics concepts are unclear and confusing providing no real value
3-4	i. Controls are quite unintuitive and somewhat responsive ii. Movement is basic but somewhat natural and fluid iii. Progression system is present but is inconsistent	i. Art style is somewhat consistent but basic. ii. UI is somewhat user-friendly and satisfactorily understandable. iii. Character and environment designs are basic and somewhat appropriate	i. Background music is somewhat distracting and somewhat fitting. ii. Sound effects are somewhat clear and satisfactorily appropriate.	i. The game occasionally crashes and has some major bugs ii. Loading times are somewhat long iii. Low optimization (works on higher side of average computers)	i. Few economic elements are implemented (3-5 elements). ii. Economics concepts are somewhat clear but somewhat confusing
5-6	i. Controls are mostly smooth and responsive. ii. Movement is fluid and natural with occasional stiffness. iii. Progression is mostly consistent, easy to understand and engaging.	i. Art style is consistent and visually appealing. ii. UI is user friendly, clear and intuitive iii. Character and environment designs are appropriate and detailed	i. Background music is fitting and enhances the game experience ii. Sound effects are clear and appropriate.	i. The game barely crashes and has few minor bugs ii. Loading times are short iii. Optimization is good(works on average spec computers and above)	i. A good amount of economic elements are implemented (6-7 elements). ii. Economics concepts are clear and quite educative.
7-8	i.. Controls are very responsive, intuitive and precise. ii. Movement is extremely fluid and very natural iii. Progression is consistent and rewarding and keeps players motivated	i. Art style is consistent, immersive and very appealing ii. UI is consistent visually and enhances the overall user experience iii. Character and environment designs are very appropriate and detailed	i. Background music enhances the experience of the game and makes it immersive and is very fitting. ii. Sound effects are very high quality, complement their causing factor and contribute to immersion.	i. The game runs flawlessly with no crashes and has close to zero bugs ii. Loading times are very short iii. Very well optimized (works on below average spec computers and above)	i. Near perfect amount of economic elements are implemented (8-10 elements). ii. Economics concepts are clear and interactive leading to the player being educated.

Strand iii-Plan for achieving the product

In order to meet the highest level of criteria I set earlier, I had to create an action plan that I would end up following over the course of my project. The first is the more detailed one of the pair, this would contain every single task that is required for completion both pre-production and during production, sub-tasks that are required to be completed in that step, proper deadlines with a 1 day buffer, the success criteria it covers, the sources and skills required for completion, priority, and it's final status with any changes that were made during that step as shown in fig A7. Additionally, I have also created a Gantt chart as shown in fig A6 to keep me on track and meet my deadlines. This was much broader and gave me a wider overview of the tasks for each month that was dedicated to product creation. I adapted the plan as per my preferences and working behavior. For example, I identified that I work better when not under pressure and produce documents and products to a higher level, hence I planned in a way that most of the work is done during the summer break so that I am not pressured with the extra workload which I would face getting deeper into year 11. While working in the summer I had also made sure to factor potential challenges that I might face such as going on vacation, meeting friends, going for classes and more. I also considered other issues out of my control such as power cuts that could happen in other countries such as India where I went.

Keeping these challenges in mind I made sure to dedicate appropriate amounts of time for each step along with buffer days as well. I also had to set realistic goals that I would be able to assuredly complete

A6 – Gantt Chart



within the time frame I had while also doing well in other normal work such as studying for the MYP e-assessments, external test preparation and more. A specific example would be when my deadline for completing basic prototype development landed on a day where I had an external class for a training program, I made sure to use the buffer day to cover up for the work.

A7 – Action plan

Dates		Task	To complete	Sources and skills required	Priority and term	Success Criteria	Status
Pre-production process							
July	1st to 20th	Online learning	• The entire course *https://www.udemy.com/course/create-a-complete-2d-platformer-in-the-godot-engine/?couponCode=SKILLS4SALEB*	Udemy and thinking and research ATL skills to properly learn and take in information from the course	High Long-term	Gameplay mechanics	Completed
	22nd to 24th	Planning and brainstorming	Plan: • Level features • Menu features • Player abilities & design • Object/NPC abilities & design • Main game loop • Progression system • Sound FX	Mind mapping tools, and ATL skills of organization to set up a plan for each and every element in my game	Middle Long-term	All apart from technical performance	Completed
Production process							
	26st – 31st (next month)	Basic prototype development	• A prototype of the final game to test various factors such as movement. • Sound/music and art will not be present	Game development software (Godot) and ATL skills of research and thinking skills to transfer my knowledge from my course and to also research about any issues encountered.	High Short-term	Gameplay mechanics, technical performance, IEE	Completed
Aug	2nd – 7th	Beta testing	• Have 4 peers test the game to find issues • Have a professional game designer test the game	4 peer subjects and a professional game designer are required alongside a survey. I will need the ATL skill of self-management primarily to reflect upon my early draft of the game and note them down.	Middle Short-term	Technical performance, gameplay performance	Completed
	8th – 14th	Redrafting	• Fix issues / flaws recognized in earlier step	Godot and ATL skills of thinking and research. This is so that I can effectively implement solutions to issues and ideas mentioned in the survey by both using my knowledge from the course and research for bug fixes.	Middle Long-term	Gameplay mechanics, technical performance, IEE	Completed
	16th – 31st	Environment npcs, objects, and levels coding	• Complete the coding of the levels and barriers by building on the early prototype. • Complete coding of npcs, their abilities and objects by building on the early prototype.	Godot, and ATL skills of thinking and research. This is because I will have to complete the environment system from prior knowledge and research solutions for any unforeseen bugs that may occur.	High Long-term	Gameplay mechanics, IEE	Completed
Sep	1st- 6th	Player coding	• Complete coding of movement system, abilities etc. with sample sprites by building on the early prototype.	Godot, and ATL skills of thinking and research. This is because I will have to complete the player system from prior knowledge and research solutions for any unforeseen bugs.	High Long-term	Gameplay mechanics, IEE	Completed
	8th – 13th	Art and animation design and implementation	• Complete design of characters objects and environments' ~~sprites~~(no learning because I am familiar with procreate pixel art from prior experience) • Complete implementation of each designed sprite or asset	Art editor software(procreate), and ATL skills of Research and thinking. This is because I need to be creative with my art and need to use my research skills to find art assets online that can be used or edited for the purpose of my game.	High Short-term	Art and Design	Completed
	15th – 20th	Sound design and implementation	• Learn sound design with a small ~~course~~(sound will be designed side-by-side the course): https://www.youtube.com/watch?v=KHMfVYMhMpg&list=PLLvqBOdfzNmOZzW7UYflU4YrXEVt055ot&pp=iAQB • Complete production of all sound ~~effects~~(FX) and background music	Music editing software (Garage band) and ATL skills of creative thinking and research. This is because I need to be creative in making a sound that is appropriate to my game and need to use research skills to find appropriate resources for the sound design including sound samples, basic fx and more.	High Short-term	Sound and Music	Completed
	22nd – 30th	Final pre – completion testing and bug fixes	• Test videogame with 5 peers • Test videogame with a professional game developer • Testers will look for bugs and other issues and fill out a proper review form • Improve product with the data acquired from the earlier step	Survey with 5 people, professional video game developer and economics teacher, and godot software alongside ATL skills of self-management and critical thinking. This is because I will have to reflect on my game with the help of others and use critical thinking skills to solve them.	High Short-term	All	Completed

Criterion B – Applying Skills

Strand i - Learning Goal

Achieving the learning goal – creative thinking skills:

Throughout the process of learning, my creative thinking skills were imperative. I had to do some pre-planning during the learning process so that I would learn the correct things for my product. This meant that at a rather early phase in the project, I had to be very creative. Prior to starting the learning process, I was aware that my creative thinking skills were few of my mediocre skills as I was not utilizing them properly in day-to-day activities and extra curriculars. There were two specific examples where I had to properly utilize creative thinking skills to end up with a proper idea for different things such as my core mechanics, art or even the music and sound effects. One notable instance where I made full use of these skills would be while doing pre-planning for my core mechanics. Core mechanics refer to the mechanics the game would be centered around, in the case of my platformer an example would be movement mechanics. For this I had to use my creative thinking skills to paint a picture of what I would want the final game to look like in my head so that I could ideate about mechanics. With the use of a mind-map(Fig B1), I was able to collate all my basic ideas and then make sure that I was completely learning most of these concepts and gathered resources for the ideas not covered in my course.

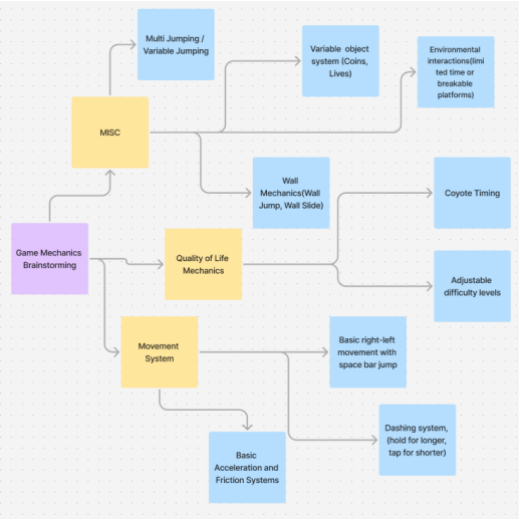


Fig B1 – Brainstorming some of the specific game mechanics I wanted to learn and implement in my product

In an other instance, I had to learn to creatively build upon other people's work. The reason I was forced to use other people's work was that it was just straight-up more efficient and ideal for the time frame. An issue I faced was that sometimes I could not find the assets I exactly imagined, but rather had to build up on pre-made assets. I had to make use of my creativity, to adapt and build upon the asset since making my own asset was not feasible due to the time it would take and issues I expected to face, such as making sure it was correctly formatted, the animations worked fine and etc. I ended up making multiple drafts of my character with different designs to find the best fit (as shown in fig B2), which was decided by both personal thought and external feedback. Through these two instances and also an early product related mind-map I had made shown in Fig A3, I learnt to **"Use brainstorming and visual diagrams to generate new ideas and inquiries"** and to "**Design improvements to existing machines, media and technologies"**(ATL Skills – MYP Personal Project).

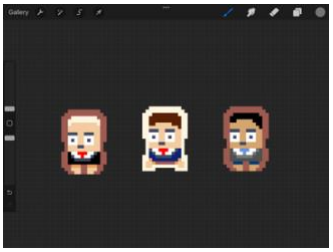


Fig B2 – Drafts of my main character

Strengths of my Creative Thinking skills	Weaknesses of my Creative Thinking skills
I effectively utilized creative thinking skills during the pre-planning for my game prior to starting the learning process. By visualizing core mechanics like movement, I created a mind map to organize my ideas roughly. This helped me gather necessary resources and learn concepts beyond my planned course, helping me directly getting into developing later on.	I was not always able to adapt to existing assets that I had planned on using. This sometimes led to extended amounts of brainstorming which sometimes also led to burnout for a limited period. Additionally at some points of texture planning I had something too complicated planned and struggled to come up with a simpler idea that would be more ideal for my game and time frame. It once again increased the amount of time I had to spend on ideating.

Achieving the learning goal – organization skills:

Proper and effective usage of organizational skills was imperative for the completion of my learning goal within the time period since it was quite large and required me to go through different sources and not just one course. I found myself working better by setting small micro-goals which were achievable in short periods of time. This made me feel a sense of completion as I kept striking this sub-goals which worked towards larger goals. I split the main goals into sub-goals and kept them on my reminders app. This was because I found myself using my phone and laptop throughout the day, with the help of the reminders app I was able to meet my personal deadlines. Fig B3 shows my list of reminders at a certain point in time towards the beginning of my learning process. Additionally, I had created a Kanban board, I was able to more efficiently manage tasks with the use of a visual tool like a kanban boards. They made progress tracking easier by grouping work into columns like To Do, In Progress, and Done. This visibility improved my productivity by assisting in the identification of bottlenecks and task prioritization. Since they were

extremely visual, I would get motivated as I kept completing tasks and moving them to the ever growing pile of completed tasks. Fig B4 shows an Eisenhower square that I used at a certain point of time. The square helped me prioritize my tasks and update other tasks' importance and priority as I completed high priority tasks. With the help of both these organizational techniques and my plans from earlier in criterion A(fig B3 and fig B4) I was able to stay on track throughout the project. I was able to "**Set goals that are challenging and realistic**" and learnt to "**plan short-term and long-term assignments: meet deadlines**" (ATL Skills – MYP Personal Project). The two skills were not something I was completely unfamiliar with but, I had never practiced them for a goal of this scale. I learnt a lot about how I can organize myself during extremely large projects and also learnt for next time that I could keep a set of mid-term goals since I found that some of my goals were either too short-term or extremely far-fetched/long-term.

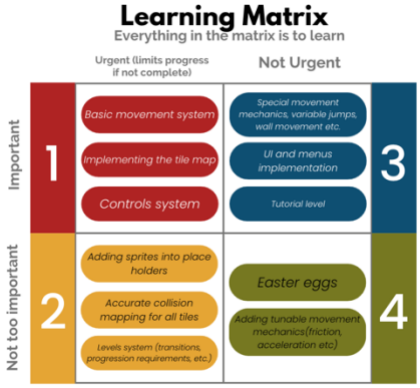


Fig B4 – Eisenhower matrix during pre-production



Fig B3 – Reminders list during learning

Strengths of my Organizational skills	**Weaknesses of my Organizational skills**
I was able to organize my large goals by breaking them into longer term and short term goals. I made long-term and short term plans which were detailed and led me throughout the project. They were to a level of detail where I did not need to ponder upon what I had to do next at any point of time or plan something again.	I think at some points I had ended up overplanning. This meant that I had broken the tasks into too many extremely small tasks. This at times made it daunting, seeing that I had x number of tasks left being a high number. I also think at some points I had spent too much time making these micro-goals and extremely short-term plans which could have been used to just work on my project.

Achieving the Learning goal - Research Skills – Information literacy:

Source	Origin	Purpose	Value	Limitations
Udemy.com/course/create-a-complete-2d-platformer-in-the-godot-engine/	This course was created for and is offered on Udemy, a popular online learning platform that offers various courses for many different things, including game development. The course author is FireBelley games and indie game developer and Godot enthusiast (as described on his portfolio)	The course is designed to teach beginners and intermediate learners how to create a complete 2D platformer game, mainly just the technical side, using the Godot Engine. It covers core mechanics, scripting, level design, and game development concepts through a step-by-step approach which would lead to a final project which would be a culmination of my learning.	**Origin**: Udemy is a well-established educational platform, which lends credibility to the course since Udemy holds strict course reviews before publishing them. **Purpose**: This course provides a very well structured, hands-on learning experience, making it perfect for learners who want direct and practical guidance in building a game, which is directly applicable to a student who is on a tight timeline.	**Origin**: Since Udemy is a paid platform (15 usd on sale), the content is stuck behind a paywall. This is not ideal and limits the accessibility of the course. **Purpose**: The course has a lot of focus towards game polish and feel accounting to almost half of the course. This is limiting since that time could be used to teach other concepts as high amounts of focus on game feel and polish is more catered towards people who want to publish games properly which beginners and intermediate programmers would not do.
Today At Apple event on introduction to garage band	This event was hosted by Apple at one of their retail locations (Dubai mall) as part of the "Today at Apple" program, which provides free workshops on various Apple products and creative skills. The session was led by an Apple expert familiar with GarageBand and music production basics.	The purpose of this event was to introduce attendees to the basics of music-making using GarageBand, providing hands-on experience and guidance in using the software to create music.	**Origin**: The event was organized by Apple, ensuring that information about GarageBand was accurate and directly aligned with the software's features and updates since Apple created the software and it was taught by apple professionals **Purpose**: The hands-on, interactive nature of the event allows attendees to actively engage with GarageBand, making it a valuable and practical learning experience for beginners in music production looking to make their own.	**Origin**: The event is specific to Apple's retail environment, meaning it might be focused on promoting Apple products rather than offering a comprehensive or unbiased view of other music-making software. **Purpose**: The session typically has a small scope and only covers quite a basic introduction to GarageBand. There is no progressive pathway where attendees can go to a more advanced event the next visit.
Youtube video by game developer Adam C Younis on a crash course for Aseprite	This video was created by Adam C Younis, a YouTube content creator focused on game development tutorials. He has a following within the game development communities and is also in the process of making a videogame for publishing, adding credibility to his tutorials. The video was published on YouTube.	The purpose of this video is to provide a crash course in Aseprite, teaching viewers the basics of creating pixel art in the software. It aims to familiarize beginners with Aseprite's interface, tools, and essential techniques for creating and editing pixel art for videogames.	**Origin**: Uploaded on YouTube, the video is widely accessible at no cost, which makes it valuable for beginners and students looking to learn pixel art without spending money on every small course. **Purpose**: The tutorial format is concise and practical, covering key features and tools in Aseprite, which is beneficial for those looking to quickly gain foundational skills in pixel art.	**Origin**: Since the video is on Youtube, it is user-generated content without formal quality control, meaning the accuracy and depth of information relies solely on the creator's expertise and approach, which could not be of high standard. **Purpose**: As a crash course, the video may only cover basic concepts, leaving out some essential techniques or in-depth explanations that people might need, therefore slightly limiting its usefulness.

Fig B5 – OPVL evaluation of my main learning resources

To my learning goal research and information literacy skills are essential since I need to find proper learning resources such that I am able to make my game at maximum efficiency later and with the cleanest code(for optimization). Since I have already used these skills in the past in the MYP for humanities related subjects, I was quite confident my skills already. Working towards beginning the learning goal I made sure to **"Collect, record and verify data"** (ATL Skills – MYP Personal Project)**.** I researched and multiple sources for the concepts that were not covered in the course I had picked initially. To justify the validity of my sources, I created an OPVL table as shown in fig B5. The evaluation was imperative since I had to make sure that my learning sources were accurate and reliable, else I would have to relearn some concepts later during the production process disturbing the plan I had put in place.

Strengths of my information literacy skills	**Weaknesses of my information literacy skills**
Information literacy skills that I had in the past were extremely helpful and can be deemed as a strength. This was because I was effectively able to gather sources for exactly	At times I found that the sources I had found were quite complex and had concepts that were advanced. This at some points made it hard for me to interpret some

what I wanted to learn and I was able to effectively evaluate them to make sure that the sources I was using for my learning goal were reliable and accurate to a high degree.	information and teachings from some sources. Hence what I did was I made use of alternate sources sometimes for the sub-concepts/concepts I didn't understand or tried asking the game programmer I was in contact with about learning resources that are used.

Strand ii - Product Goal

Achieving the Product Goal - Self-management – Affective skills

A skill I struggled with throughout the production process of my product(videogame) were self-management skills and more specifically affective skills. Affective skills refer to the skills required to manage the state of my mind and include perseverance, self-management, emotional management, resilience and mindfulness.

Whenever I implemented a certain system, tried to make a certain sprite, tried a certain kind of beat etc. and it did not turn out well, I often found myself not wanting to continue in the same direction, I always felt down and felt like giving up. I always had an idea in my head as to how exactly I wanted the game to look, how the movement had to feel, how difficult the game was and more to a high level of detail. This was a mindset that I had towards many other such projects or assignments I always found myself being unhappy with something that did not go my way or kept setting higher and higher goals one after the other. Although this does push me to a higher level I had to overcome this mentality as a "flawless" end product is never possible. I realized that when faced with adversity I had to **"demonstrate persistence and perseverance"** with the use of multiple methods. Throughout the production process I faced obstacles many times, with everything from a simple code syntax error all the way till one of my sprites getting deleted, but I explored ways to deal with it. For instance, while designing a key game mechanic I had to "**practice dealing with disappointment and unmet expectations**" and also to "**practice analyzing and attributing causes for failure**" (ATL Skills – MYP Personal Project) as what I had initially envisioned to be a flawless, ultrasmooth and complex movement system, after completion felt very blocky. After several failed attempts in trying different movement systems from tutorials and code excerpts I had found online I considered giving up the idea as a whole and settling for the blocky movement, but instead I decided to adapt. I adapted by analyzing the entire movement system and what made it fail. I created a sort of logging table for the underlying sub-issues to figure out the issue, source, difficulty and time to fix and my core learnings from the error ash shown in fig B7. The final mechanic ended up being a bit simpler in some aspects but it was of quality, it was smooth and enjoyable which is preferable over a complex system that would be unenjoyable and low quality. This was a key learning experience quite early on to the production process benefiting me throughout the rest of the process including art and sound production. Another moment where I had to overcome my tendencies was during the creation of the game's difficulty curve. A well-designed difficulty curve revolves around finding the ideal ratio between the skill of players and the degree of difficulty of the game. I had kept the difficulty management towards the end of the time I had allocated for completion of the game. The issue with this was that I had less time to edit the difficulty curve, and kept feeling that the difficulty curve was not balanced at all. I constantly kept getting discouraged, every time I asked for feedback from a peer, I seemed to get a negative response, it was getting either too difficult or too easy. Getting closer and closer to my self-set deadline I constantly kept getting more stressed. While facing this adversity though I learned to **"practice strategies to reduce stress and anxiety"** and to **"practice managing self-talk and positive thinking"** (ATL Skills – MYP Personal Project). Getting closer to the deadline I made sure to only work on the system for a set amount of time with breaks in between. I also did

Initial

```
extends CharacterBody2D
class_name Player

export var gravity = 400
export var speed = 100
var jump_force = 250

func _physics_process(delta):
    if is_on_floor() == false:
        velocity.y += gravity * delta

    if Input.is_action_just_pressed("jump") && is_on_floor():
        jump(jump_force)

    if velocity.y >= 500:
        velocity.y = 500
    var direction = Input.get_axis("ui_left", "ui_right")
    if direction != 0:
        $AnimatedSprite2D.flip_h = (direction == -1)
    velocity.x = direction  * speed
    move_and_slide()
    update_animations(direction)
```

Improved

```
extends CharacterBody2D
class_name Player

signal jumped(is_ground_jump: bool)
signal hit_ground()


export var input_left : String = "move_left"
export var input_right : String = "move_right"
export var input_jump : String = "jump"

const DEFAULT_ACCELERATION = 150
const DEFAULT_MAX_JUMP_HEIGHT = 150
const DEFAULT_MIN_JUMP_HEIGHT = 60
const DEFAULT_DOUBLE_JUMP_HEIGHT = 100
const DEFAULT_JUMP_DURATION = 0.3

var _max_jump_height: float = DEFAULT_MAX_JUMP_HEIGHT
export var max_jump_height: float = DEFAULT_MAX_JUMP_HEIGHT:
    get:
        return _max_jump_height
    set(value):
        _max_jump_height = value
```

Fig B6 – Code excerpts from initial and improved movement systems

Issue	Source of Issue	Difficulty of estimated fix	Learnings from the error	Estimated fix time
Movement feels stale in long straight parts of the map	Fixed acceleration value	Medium(A bit of technical work required)	Make sure to completely understand the importance of these small kinds of things like acceleration to keep basic movement engaging in longer periods of movement.	20 Minutes
Character movement and behavior in air feel blocky	Improper velocity adjustments in the character's physics calculations during airborne states	Hard(Will require a good amount of technical work, will likely have to change other systems as well)	To have proper air control, the physics system has to have more depth and more adjustable variables affecting the feel.	45 Minutes
Character does not respond to inclines in the environment	Missing slope adjustment in sprite adjustment based on different scenarios	Easy(Little overall work, small fix)	Proper small elements such as the sprite slanting at a slope, are important for the game overall and should not be lightly taken when the fix is quite easy.	10 Minutes
Jump height feels very rigid	Fixed jump height	Medium(A bit of technical work required)	Make sure to completely understand the importance of these small kinds of things like jump hiehgt to keep it engaging throughout and less repetitive	20 Minutes
Player freezes in place when opposing directing keys are pressed	Input conditional statement	Medium(A bit of technical work required)	Make sure to look for conflicts in input mapping and any resulting errors	20 Minutes

Fig B7 – Sub-issues log table

my best and tried to be positive about what I could change and during these breaks I was doing activities that relieved me of stress such as running and playing cricket with friends. Towards the end I made use of the buffer day that I had planned and ended up with quite a well-designed difficulty curve which had a couple small flaws.

Strengths of my Affective skills	Weaknesses of my Affective skills
I was able to demonstrate resilience when needed by adapting my approach when I faced obstacles. Adapting made me prioritize quality in my game rather than complexity leading to a more refined final product and I was able to gain a more in-depth understanding of game design.	I had struggled with self-management, often feeling discouraged when my execution didn't meet expectations. As a result, I had a tendency to give up on aspects of the project particularly during challenging phases ultimately leading to some delays and overall decrease in motivation
I was able to emotionally manage myself through stress-reducing activities, like running and playing cricket, which also helped me maintain a positive mindset during times of challenge. The strategies allowed me to approach roadblocks with a clearer perspective and renewed energy.	I faced difficulties managing my self-talk, particularly when receiving negative feedback, I found myself adding to it. It ultimately led to increased stress levels for periods of time under which I was not able to work very well.

Achieving the Product Goal - Communication Skills:

Communication skills were skills that I had infact used in the past, an example that comes to mind would be when I had to communicate with peers for feedback for my product design and digital design products in MYP-3. As these skills were crucial for achieving my product goal, I focused on honing them throughout the process of my personal project. I often found myself asking for feedback from close friends(exchanged feedback) and family. I did make sure to consult the different age demographics about different criteria, for example, I did not take feedback about gameplay from my parents but rather from fellow students who have a general expectation about videogames in general. This can be seen in **fig B8** where I messaged my parents concerning the difficulty curve in the game. Based on this feedback, I added an extra type of easier enemy that I had not planned about before so that I could adjust the difficulty curve to make it more progressive. Overall, the feedback worked like constructive criticism and did nothing but help improve my personal project.

Another example of my use of communication skills would be when I contacted a professional game designer at a company that co-develops AAA games (highest quality level of videogames). I had contacted him on multiple major milestones such as the completion of the first prototype, completion of the player scripts (which was also the completion of all game programming) and finally for the final step where I required feedback on my final game with all the art and music. When I contacted him regarding the final game, he commended me on the aesthetics/art of the game, the difficulty curve and progression. But he did give me feedback mentioning about the movement system. He recommended adding a buffer for the jumping mechanism in my game would make it easier for the player to time important jumps and make the mechanism less frustrating. From his recommendation I then improved the jumping mechanism by adding a feature called "coyote time" which worked exactly like the buffer he had mentioned. He said that he had seen this feature in other successful platformers such as Celeste. This feedback is clearly shown in **fig B9**. Making use of all this feedback to improve my final product shows clear usage of communication skills in the production process. In the end, I was able to "**give and receive meaningful feedback"** (ATL Skills – MYP Personal Project)**.**

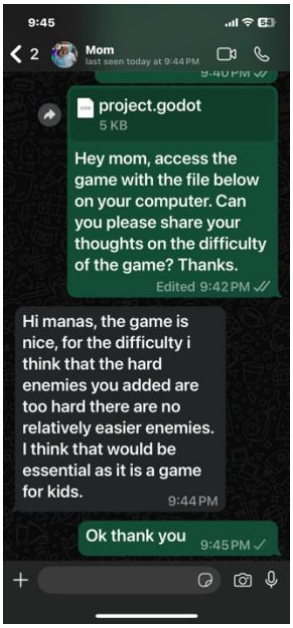


Fig B8 – Series of texts with my mother asking for feedback

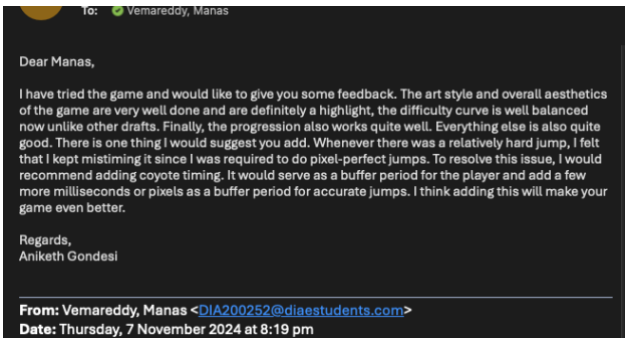


Fig B9 – Email reply from a game-dev giving me feedback

Strengths of my Communication skills	Weaknesses of my Communication skills
I was able to keep in contact with a professional game developer and multiple family members and friends	I found that at times I was not able to completely listen to feedback from my friends or family. This was because I already

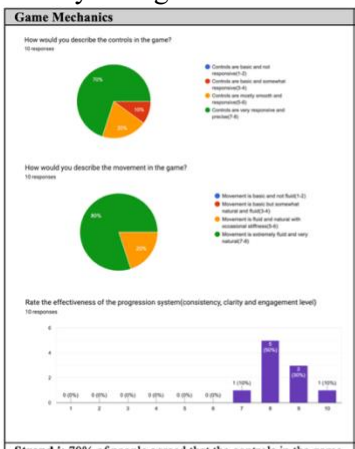
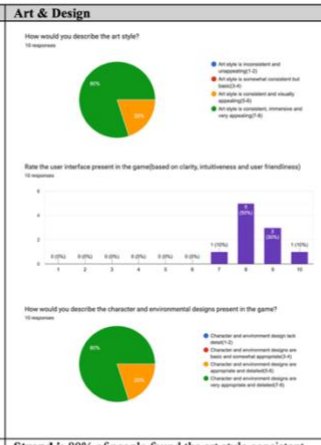
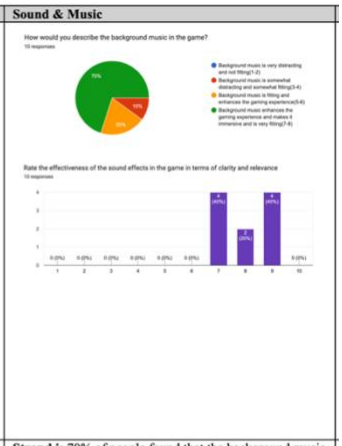
throughout for constant feedback. By being in touch with criticizers, I was able to make sure that I was going in the right direction, and they were helping me build on my project to make it better. The contact also helped since at some points it also gave me motivation, for example if I was feeling down because of something, my family members were able to motivate me.	had a kind of set idea in my mind causing me to not take some points of feedback seriously or made me attempt forcing my ideas on to my friends or family. The set idea sort of overshadowed what was potentially relevant feedback.

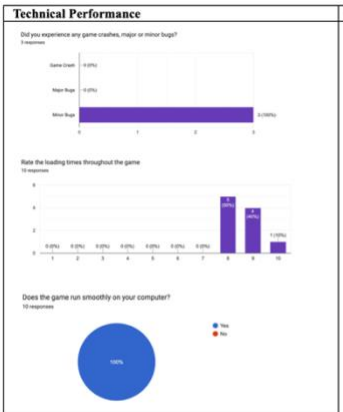
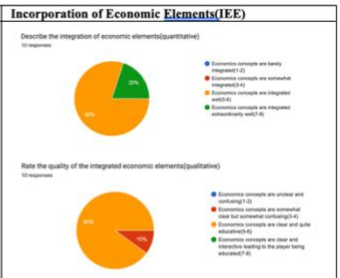
Criterion C - Reflecting

Strand ii

Product Survey and Data Analysis:

Post completion of my product, I sent out a survey to my peers to get valuable feedback which would help me test my game against my success criteria. Their feedback gave me an idea as to what sub-criteria/strands were my strengths and which of them were weak. The table to the side shows the results that were gathered from this survey.

Game Mechanics	Art & Design	Sound & Music
		
Strand j: 70% of people agreed that the controls in the game are very responsive and precise with another 20% agreeing that they are mostly smooth and responsive. **Level: 7** **Strand ii:** 80% of people found the movement system extremely fluid and natural while the other 20% though it was fluid and natural faced with occasional stiffness. **Level: 7** **Strand iii:** The average rating of the progression system was 8.4 and can be inferred that the reviewers graded it at 84%. **Level: 7**	**Strand j:** 80% of people found the art style consistent, immersive and very appealing while the other 20% found it just consistent and visually appealing. **Level: 7** **Strand ii:** The average rating of the user interface was 8.4 translating to 84%. **Level: 7** **Strand iii:** 80% of people thought the character and environment designs are very appropriate and detailed while 20% thought the designs were just appropriate and detailed. **Level: 7**	**Strand j:** 70% of people found that the background music enhanced the gaming experience and made it immersive and was fitting while another 20% responded that they found the music as fitting and somewhat enhances the gaming experience. **Level: 7** **Strand ii:** The average rating of the sound effects ended up at 8, translating to 80%. **Level: 7**

Technical Performance	Incorporation of Economic Elements(IEE)
	
Strand j: 3 of 10 translating to 30% of the people experienced minor bugs. **Level: 6** **Strand ii:** The average rating of the loading times was 8.6 translating to 86%. **Level: 7** **Strand iii:** 100% of the people were able to successfully run the game on their computer and reported that it was running smoothly. **Level: 8**	**Strand j:** 80% of the respondents thought that the economic concepts are integrated well(quantitatively) while 20% of the respondents thought that economic concepts are integrated extraordinarily well. **Level: 6** **Strand ii:** 90% of the respondents found the economic concepts to be clear and quite educative. **Level: 6**

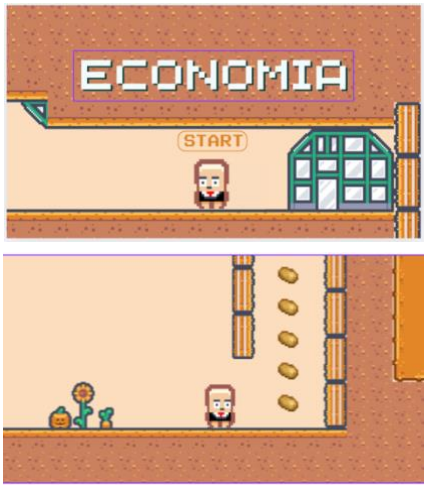
Data Analysis: My survey gave me a very good overview as to what other people think about my game and more specifically the strengths and weaknesses of each and every strand that was a part of my success criteria. In terms of the game mechanics most of the people were happy with the controls movement and progression and I got multiple people rating my movement and controls at the maximum level showing that it is one of my strengths. In terms of art and design, most respondents were happy with the overall art and design while a relatively lower(between the 3 strands) average rating of 8.4 out of 10 shows that there is a bit of improvement to be made in the user interface design. The overall sound and music aspects were also rated quite highly with quite a bit of room for improvement in terms of the sound effects as the average rating was 8 out of 10 and background music was equally split between levels 5-6 and 7-8. Technical performance wise, the game has been rated highly between loading times, optimization and bugs, everyone was able to run the game rated high loading times and only 3 people faced minor bugs. Finally, the incorporation of economic elements, this part was perhaps my weakest aspect, I was rated fairly average in both the quantitative and qualitative side of the incorporation elements, on the quantitative side, ratings seem to be on the higher of the 5-6 level while on the qualitative front it seems to be on the middle or lower level of the 5-6 level.

Evaluating my product based on my success criteria:

Criteria	Grade and Justification	Strengths	Weaknesses	Improvements
Game Mechanics	7/8 – *As most of the respondents of the survey rated highly between the 3 strands with strands i and ii getting strong 7s while strand iii achieved a weaker 7, which added up to a 7 overall.*	**Strand i)** The controls within the game were very responsive and precise, allowing for easy playability. **Strand ii)** The movement system present is extremely fluid and natural, helping make the game a good platformer as it is a key feature of platformers.	**Strand iii)** The progression in the game was quite consistent but the rewards system and motivation side of things was not quite as good. This was likely because I had not given too much time or the required importance towards this system and fine-tuning it.	To achieve higher overall performance, I could give more importance towards the progression system (strand iii). This includes making the storyline of even better quality and improving the delivery of it. The storyline will have to be more directly implemented so that it is more apparent and so it can influence the game feel
Art & Style	7/8 – *This grade was achieved since the data showed that all the strands were rated equally highly by respondents.*	**Strand i)** Overall art style throughout the game is immersive, appealing and consistent, helping make the game visually enjoyable. **Strand iii)** Environmental and Character designs both are very detailed and appropriate, working together to create a	**Strand ii)** UI was found to be relatively simple and the number of features it possessed was on the lower end of the spectrum. A potential key function in some people's opinions that was not present was the option to change controls completely through the menu.	To achieve a higher grade, I need to focus on improving the user interface (strand ii). This can be done by improving the UI designs by spending more time on them and adding more detail that correlates with the theme of the game. Secondly, the functionality of things like pause menus can also be increased by adding more features such as controls adjustability and more.
Sound & Music	7/8 – *As the majority of the respondents had found that the background music and sound effects were of quite a high standard the respective grade was achieved.*	**Strand i)** Background music is well composed and works to enhance the overall game experience by contributing to immersion. Music is also very fitting and appropriate.	**Strand ii)** The sound effects were overall quite good. However, some of them lacked appropriateness and some failed to complement their causing factor since not all of these sound effects were created in-house.	To reach a higher level of quality in this area I need to improve the quality of the sound effects (strand ii). This can be achieved by researching and producing more appropriate and sophisticated sound effects in-house (as some sounds were taken from external resources due to time constraints during production) so that they precisely fit my game.
Technical Performance	7/8 – *Since 2 of 3 strands in this criterion achieved high rankings with one achieving a perfect 8 and the other strand was at the higher end of the grade a grade of 7 was achieved.*	**Strand ii)** Loading times are overall very low allowing for smooth transitions between levels and represents the quality/simplicity of the code and optimization as good. **Strand iii)** Optimization levels are extremely high as the game runs well on all tested computers (low, average and high spec) helping make the game more accessible to people with different kinds of computers.	**Strand i)** A relatively high percentage of 30% of the people had experienced minor bugs (ex: slight collision mapping error on a half block). Likely due to a lack of experience in debugging, access to high quality game testers and time to finely check all the aspects towards the end of the game.	To achieve the next level of quality I need to improve reduce the probability of experiencing a bug (strand i). This can be done by improving the debugging process and holding better game-testing and review session so that more bugs can be identified early on and eradicated.
Incorporation of Economic Elements	6/8 – *Since both strands (quantitative and qualitative) were rated at mediocre to high level, with the qualitative side's data being weaker than the quantitative, a grade of 6 was given.*	**Strand i)** There is a good amount of economic elements present within the game. This shows that the economic aspect of the game is evidently present and not just a small little gimmick.	**Strand ii)** The quality of the economic elements implemented seem to be quite lacklustre. As I did not properly plan this aspect of the game and also kept changing the economic elements at different points of the process it led to a decline in the quality.	To improve in this aspect of the game I would have to focus on both the quantity and quality of economic elements implemented. In terms of quantity, one more major economic element can be added such as equilibrium and one minor implementation can be made like making the environment more like wall-street for example.
Final Level: 7 7 + 7 + 7 + 7 + 6 = 34 34/5 = 6.8				

Changes made and why I made them:

Firstly, I had made quite a big change in terms of project organization. I decided to sort of combine the learning part and prototype development part together (also lead to their assigned times getting combined). As I started the main technical learning, I realized that although it seemed like I was learning while watching the videos and completing the short tasks, when I was trying to implement them at a later date, I was unable to. Working on the prototype forced me to properly learn the techniques, provided more practice, and gave me some more flexibility since I had combined the timelines. This meant that the prototype development was a part of the learning process as well as the main product creation process. Secondly, I decided to use and build upon free assets quite a lot. Initially I planned to produce most of the art and sound assets by myself and in-house, but then I had to shift my level of reliance on external assets to be higher than planned. This was once again primarily because of the time frame, I figured out that I would not be able to create that many assets for both art and sound, or even if I were able to it would cause a lot of stress and the quality of assets just would not be as good as if I used assistance from other assets. This decision was also influenced by my inability to implement some of my early assets into the game since errors kept occurring stemming from a variety of causes including things like formatting, aspect ratios and more. Finally, I made a change to the exact economic elements / link I was planning to implement in the videogame. Initially, it was going to be something where if players interacted with objects or completed levels they would have to learn content from lessons. Later I brainstormed more and decided to change that rather "boring idea"(as deemed by some peers) into a newer idea which thought more useful concepts in a more interactive way, it teaches market supply and demand by



Figs C1-3, showing the prototype (left), implementation of new main economic element in the main game (middle), change in name to be more appropriate shown through the start page.

letting the character acquire items in levels and then being able to sell those items to get money, and then use that money to progress or even invest to bring in sources of passive income. I made this change since I felt that the old idea was too uninteresting and quite boring as inferred from feedback. I feel that the new idea is much more interactive and has a higher chance of teaching the target audience than the older idea that I had come up with originally.

Challenges I faced and how I overcame them:

The first main challenge I faced was finding appropriate assets that I could use in my videogame. At first the issue was finding places to search for assets, then it was going through the large amounts of assets available searching for the perfect fit. For instance, when searching for my main character's asset, I decided on scouring itch.io, a website with lots of assets available, then as I searched sometimes the asset would be perfect but were stuck behind paywalls, other times it was just really hard to find one. To **solve** this issue, I decided that it was okay even if I could not find an asset that was appropriate for my game but would have to adjust and build on it myself. Additionally, learning the game engine (Godot) was very challenging. This was because at some points I got distracted in the course or just did not get some concepts into my head, and at times I felt handicapped without the tutorial while trying to implement seemingly simple things into my prototype that I was developing alongside the course. To solve this, I ended up spending more time practicing Godot during the learning phase and also ended up using multiple brief tutorials for small issues which did take up time. As a result, I was able to create the game on my own with some assistance and improved my self-confidence in game design.

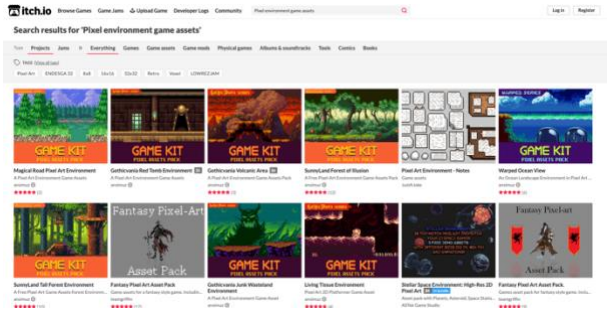


Fig C4 – A sample search on itch.io for game assets for the environment for my game

Strand i

Impact of the project on myself and my learning:

As a student, this initiative has greatly influenced me and taught me many important concepts. Firstly, it has developed my creative thinking skills and improved my ability to brainstorm and come up with new ideas effectively making me a better **thinker**. It has also taught me a big skill relating to reflecting which is viewing my product from the eyes of my target audience. Since I don't take an E-Portfolio I did not have relevant past experience in terms of designing products in a way that it particularly suits a certain target audience. But throughout the course of this project, I had to put myself in the shoes of multiple people including younger students and teachers since I had to find out what exactly they would see, what they would like and what they would hate. This has developed my skills to adapt and think like someone else, it has made me think more openly and think like other people, ultimately improving my **open-mindedness**. Another huge impact that this product has had on me as a learner was developing my **organizational skills**. To effectively complete the huge project, I had to make appropriate short-term and long-term plans that gave me enough time to complete the different tasks and in such a way that the plans accounted for any unexpected delays. I had to allocate time for both my personal project, other recreational activities and academic goals which required me to be **balanced**. Additionally, I had to be a strong **communicator** to get feedback from family, friends, the supervisor and a professional game developer which all ultimately helped me end up with a better game at the end of production. Finally, being **reflective** was imperative throughout the entire process. They always made me look for ways to improve and to keep striving to make the game to the best of my abilities. As a result, this project has given me the self-assurance and resources I need to handle challenging initiatives in the DP and beyond.

How have I developed my ATL skills?

I believe the main set of ATL skills I was able to develop during this project were my **creative thinking, affective, organizational, research** and **communication** skills. Consistently throughout the course of the project, I was required to exhibit creative thinking skills to a high level as my project is pertaining to the creative media industry of video games. I was able to effectively plan out various creative aspects of my project quite early on with the creation of comprehensive mind maps, to build upon other people's creative

work and to overall produce creative and appropriate visual art and music/sfx. Throughout different points of the process, I felt that my affective skills were consistently challenge, sometimes it was the feeling of being overwhelmed and buried on the workload while at others it was because I was upset with the work I had done. As a result of this, I have learnt to bounce back from small challenges and setbacks and learnt to channel my inner resilience and be persistent. For instance, I had constantly been receiving negative feedback about the difficulty curve in my videogame, this made me annoyed and upset that it was not making me think to give up at some points. I had to hold it together and work persistently towards fixing it even if it meant having to push my deadline by a day or two. During the entirety of the project, I had to and was able to effectively organize and plan my time to meet each deadline through various tools including, action plans, GANTT charts, to-do-lists and a Eisonhower square. Since I never took on such a large and time-consuming project previously, my organizational skills were never really tested, and I had to hone them during this project. Completion of each small step gave me the much-needed confidence that I could complete the project. I have also been able to develop my information literacy skills. Gathering learning resources, interpreting information from these sources and exploring the validity of these sources with the help of OPVL tables all worked towards honing my information literacy skills. Another big skill I developed consistently throughout the personal project were my communication skills. I never used communication skills as rigorously in any of my prior projects in the MYP program, hence I did not particularly consider them a strength prior to starting the project. The personal project however, required me to constantly ask for feedback from family, friends and industry professionals alike to improve upon my product. It made me develop my skills of requesting and receiving feedback. It is something that will always stay with me as it will be crucial later in life as proper feedback will have a positive impact on any work I do.

My Strengths
One of my main strengths throughout the process of personal project would be the prior knowledge that I had before starting the project. I had completed the Advanced Placement Computer Science A exam with the top score in year 10, won an app design competition the same year, putting me on track to becoming an apple certified developer and more. Due to the nature of my project, my product's quality had a positive correlation with the amount of time I had. This is because if I spent less time on learning basic things I would be able to learn and implement relatively more complex systems and features. Prior knowledge let me skip some parts in my course teaching things that I already knew-permitting me to chase more advanced topics. Additionally, I think another big thing was about being able to create a proper balance between the different things that were going on. I had to balance time between my personal life, school/academics, extracurriculars and working on personal project. By employing multiple organizational tactics at a personal project level and at a larger level concerning all my other activities I was able to have a solid goal in my mind that I would work towards to and achieve.
My Weaknesses and how I overcame them
Throughout the process I had to work on some things that I did not particularly like since I was not particularly good at them. When I had to work on the art in the game or make edits to the soundtracks, I often perceived it as annoying and tedious work and felt like constantly postponing the work. To overcome this issue, I decided to do the same work on the same day but take either, more frequent breaks or slightly longer breaks to deal with the "annoyance". Additionally, I also had trouble dealing with stress, especially when coming close to deadlines that seemed to always overlap with some other event like an exam. I constantly would feel like not giving it my all at this point, but rather just do it half-heartedly. To overcome this issue, I employed different tactics such as utilizing meditation apps at this point, using advice from my parents and brother (who has completed the personal project in the past) and planning out whatever rest I could do with the time I had to ensure I worked to the best of my abilities in the time I had left. Finally, I had a problem with dealing with criticism. I often received some negative feedback about aspects of my game that I sent in for feedback and failed to take the criticism properly, often leading to an overall reduction in my overall motivation and will to work on the project, passionately.

Impact of the project on my future learning academically and personally:

I believe the self-management, communication, and thinking skills among others, that I have developed over this project will be imperative for my future. The creative thinking skills I exhibited will be required for coming up with unique ideas, creating websites doing creative for clubs and organizations and more. Organization skills will be essential in the future when I am handling a variety responsibility and have to find time for all of them while fulfilling them to a high standard. Moreover, my honed affective skills will allow me to stay firm and rebound from feelings of adversity and failure. Information literacy skills are another set of skills I will transfer, since it allows me to effectively perform research on many topics across subjects and will be essential for future research reports, and assignments in IB DP such as IAs. Finally, communication skills will be vital because at all points of my professional and personal career I can always improve by constantly asking for feedback. A chronologically close example would be my IAs and TOK in year 12, I will need to constantly ask for feedback from teachers and peers to create them to the best of my abilities. This project has definitely also impacted me personally, blooming an interest in the field of computer science, and giving me clarity that I would like to pursue a career that somewhat involves both computer science and economics (I had a prior interest in it) such as quantitative finance. Now, I am also more literate

with the Godot game engine and its proprietary language GdScript, giving me the confidence to pursue future passion projects. I now understand to a greater degree the complexity and meaning behind systems in larger programs. I now know just how complicated a certain system's code can be even though from first glance it may seem simple. Overall, I can confidently say that this project has given me the confidence to take on the DP program and future endeavors as a more organized and confident learner and being more comfortable in the future when it comes to programming.

Reflection based on global context:

I gained valuable new knowledge relating to my global context **scientific and technological innovation.** I now know the technical side of making videogames to a high level, how the code translates into a game, how digitized art is used, and also the scientific side, I found out just how important psychological science is since I really had to use my brain and view the game like my target audience would or had to keep them in mind when I was thinking of the game cover since it had to be psychologically appealing to them. Fig **C5** maps the new knowledge I have gained throughout the project relating to the global context.

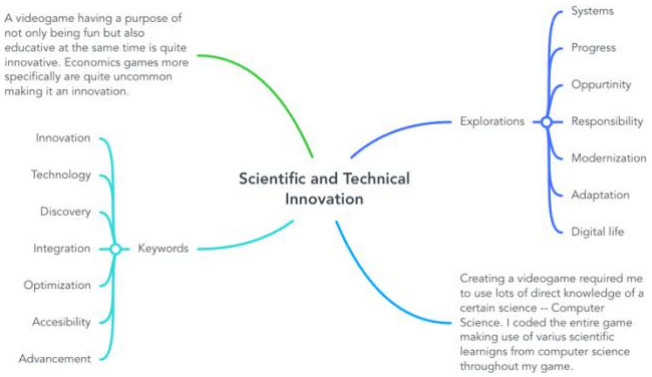


Fig C5 – Mind-map compilation of new knowledge gained in terms of the chosen global context

Evidence of new learning:

I was ultimately able to achieve my learning goal, which gave me a wider understanding of programming, art design, and sound design. In the beginning of the project, I had some prior knowledge about these concepts, but I never had the chance to hone them and apply them to make something. I had seen and played many videogames but never really explored how they were made. This project helped me dive deep into one of my fields of interest, programming. Game design, scripting, sound design and sprite designing would be just a few concepts I have learnt about throughout my learning journey. My understanding of these topics makes me view all videogames in a different way now, in a more analytical view where I seek to learn how the games and not just to play them. Fig C6 shows my new knowledge mind map with the main concepts I had learned from each big part of my game, programming, art production and sound production.



Fig C6 – Overall new knowledge mind map

Lifelong skills:

The lifelong skills I have gained from this project are the ability to plan long-term goals for projects of a large scale, to stay motivated even through times of relative turmoil in progress, to think and brainstorm creatively and to communicate with others for feedback and building upon it. Looking back to when I started, I remember being worried about having to complete an entire product individually, but completing this product, has changed my view, it has given me confidence and assurance of being independent, which is something that will have a lifelong impact.