UNIVERSIDAD POLITÉCNICA SALESIANA

Carrera de Computación

PROYECTO DE VINCULACIÓN EMBLEMÁTICO E INTERDISCIPLINAR   
“Aplicación de herramientas tecnológicas para la innovación en unidades educativas”

**Sharky Aprende**

Caso de Estudio

Versión 1.0.0

Mayo, 2025

Guayaquil, Ecuador

# Historial de Versionamiento

|  |  |  |  |
| --- | --- | --- | --- |
| **Fecha** | **Versión** | **Descripción** | **Responsable** |
| 5/5/25 | 1.0.0 | Creación de documento | Harry Game, Dánery Toledo y Emily Aspiazu |
|  |  |  |  |

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# Listado de gráficos

es sobre un juego que quiero crear y necesito un boceto. se llama sharky aprende, es educativo para estudiantes de 2do y 3eo de basica y les ayudar aprender a sumar y restar. Lo primero es el Módulo de Gestión de Usuarios
• Registro y Autenticación: Permite a los estudiantes y docentes crear cuentas y acceder a la plataforma de manera segura.
Boceto: Pantalla de Registro y Autenticación
Descripción General:
La pantalla de registro y autenticación será colorida y atractiva para captar la atención de los estudiantes de 2do y 3er grado. Utilizaremos una interfaz intuitiva con íconos grandes y fáciles de entender.
Elementos Visuales:
Fondo:
Un fondo azul claro con ondas suaves que simulen el océano, creando una atmósfera marina y relajada.
Logotipo:
En la parte superior izquierda, coloca el logotipo de "Sharky Aprende" con letras grandes y redondas, y un tiburón sonriente al lado.
Título:
Debajo del logotipo, un título grande y amigable que diga: "¡Bienvenido a Sharky Aprende!"
Formulario de Registro:
Un formulario simple con campos grandes y fáciles de rellenar:
Nombre de Usuario: Un campo de texto con un ícono de usuario al lado.
Contraseña: Un campo de texto con un ícono de cerradura al lado.
Confirmar Contraseña: Otro campo de texto con el mismo ícono de cerradura.
Correo Electrónico (opcional): Un campo de texto con un ícono de sobre al lado.
Rol: Un menú desplegable con opciones "Estudiante" y "Docente".
Botones:
Registrarse: Un gran botón verde con letras blancas

### Figura 1: Boceto de la pantalla de registro y autenticación con diseño amigable y temático para facilitar el ingreso de estudiantes y docentes.

es sobre un juego que quiero crear y necesito un boceto. se llama sharky aprende, es educativo para estudiantes de 2do y 3ero de básica y les ayudará aprender a sumar y restar. 2. Módulo de Minijuegos Educativos
• Selección de Juegos: Los estudiantes pueden elegir entre una variedad de minijuegos enfocados en matemáticas.
• Niveles de Dificultad: Cada juego ofrece diferentes niveles de dificultad para adaptarse al progreso y habilidades del estudiante.
• Feedback Inmediato: Los estudiantes reciben retroalimentación inmediata sobre su desempeño en cada juego.
Boceto: Módulo de Minijuegos Educativos
Elementos Visuales:
Fondo:
Un fondo azul claro con ondas suaves y elementos marinos como estrellas de mar, conchas y peces, creando una atmósfera submarina.
Título:
En la parte superior, un título grande y amigable que diga: "¡Selecciona tu Aventura Matemática!"
Categorías de Juegos:
Una categoría principal con íconos representativos:
Lista de Juegos:
• Selección de Operación: Los estudiantes podrán elegir entre dos tipos de operaciones matemáticas: suma o resta, antes de comenzar el juego.
• Niveles de Dificultad: Una vez seleccionada la operación, el sistema permitirá escoger entre varios niveles de dificultad (básico, intermedio o avanzado), adaptándose así al progreso del estudiante.

### Figura 2: Boceto del módulo de minijuegos educativos con categorías visuales y selección de dificultad para reforzar matemáticas de forma divertida.

### ***Figura 3: Boceto del módulo de puntos y recompensas con diseño motivador que muestra el progreso del estudiante y permite canjear logros por premios virtuales.***



### ***Figura 4: Boceto del panel de monitoreo docente con visualización clara del rendimiento estudiantil en tiempo real y generación de reportes personalizados.***

### ***Figura 5: Boceto del panel administrativo con funciones de gestión de contenidos educativos y control de usuarios para mantener actualizada y segura la plataforma.***

# Introducción

## Propósito

“Sharky Aprende” es una aplicación web educativa gamificada que permite a estudiantes de 2do y 3er grado de primaria reforzar sus conocimientos de matemáticas mediante un juego interactivo protagonizado por un simpático tiburón llamado Sharky.

## Alcance

“Sharky Aprende” permitirá a los estudiantes ingresar a una plataforma web interactiva, elegir un avatar y participar en minijuegos enfocados en reforzar habilidades básicas de matemáticas y otras áreas del conocimiento. Cada estudiante podrá completar actividades por turnos o en simultáneo con otros compañeros, obteniendo puntos y recompensas según su desempeño. Además, el sistema brindará al docente una vista en tiempo real del progreso de los alumnos, mostrando aciertos, errores y resultados por estudiante, facilitando así el seguimiento del aprendizaje dentro del aula.

## Definiciones, Acrónimos y Abreviaciones

**Sharky:** Nombre del personaje principal del juego (un tiburón amigable que guía a los estudiantes).

**RTD:** Resultados en Tiempo Real (término usado internamente para referirse al sistema de actualización de puntajes que ve el docente).

**Lvl:** Abreviatura usada en la interfaz para "Nivel".

**Pts:** Abreviatura de “Puntos”, usada para mostrar la puntuación de los jugadores.

## Descripción global

1. **Módulo de Gestión de Usuarios**

* Registro y Autenticación: Permite a los estudiantes y docentes crear cuentas y acceder a la plataforma de manera segura.
* Gestión de Perfiles: Los estudiantes pueden personalizar su perfil seleccionando un avatar y actualizando su información personal.

1. **Módulo de Minijuegos Educativos**

* Selección de Juegos: Los estudiantes pueden elegir entre una variedad de minijuegos centrados en operaciones matemáticas básicas, específicamente suma y resta.
* Niveles de Dificultad: Cada juego ofrece distintos niveles de dificultad para adaptarse al progreso y habilidades del estudiante.
* Feedback Inmediato: Los estudiantes reciben retroalimentación inmediata sobre su desempeño en cada juego.

1. **Módulo de Puntos y Recompensas**

* Sistema de Puntuación: Los estudiantes acumulan puntos basados en su desempeño en los minijuegos.
* Recompensas Virtuales: Los puntos pueden canjearse por recompensas virtuales, incentivando la participación continua.

1. **Módulo de Monitoreo y Reportes para Docentes**

* Vista en Tiempo Real: Los docentes pueden ver el progreso de los estudiantes en tiempo real, incluyendo aciertos, errores y tiempo dedicado a cada actividad.
* Generación de Informes: Herramientas para generar informes detallados sobre el rendimiento de cada estudiante, facilitando el seguimiento del aprendizaje.

1. **Módulo de Administración**

* Gestión de Contenidos: Los administradores pueden actualizar y gestionar el contenido de los minijuegos y las actividades educativas.
* Control de Acceso: Herramientas para gestionar los permisos y roles de los usuarios dentro de la plataforma.

# Posicionamiento

## Oportunidad del negocio

*"Sharky Aprende"* representa una oportunidad rentable en el sector de tecnología educativa al ofrecer una solución atractiva para padres de familia y docentes que buscan mejorar el rendimiento escolar de los niños. La plataforma se puede monetizar mediante un modelo de suscripción mensual o anual, donde los padres pagan por acceder a contenidos gamificados y reportes detallados sobre el avance académico de sus hijos.

Dado que muchos padres están dispuestos a invertir en herramientas que fortalezcan el aprendizaje de sus hijos y les brinden seguimiento claro y en tiempo real, esta aplicación cubre una necesidad concreta del mercado.

## Determinación del problema

|  |  |
| --- | --- |
| **Problema** | Falta de compromiso y motivación de los estudiantes hacia el aprendizaje tradicional. |
| **Afectados** | Estudiantes de primaria, docentes, padres y tutores. |
| **Impacto** | Mejorar el compromiso estudiantil, el apoyo a los docentes. |
| **Solución** | Gamificación del aprendizaje, retroalimentación inmediata, monitoreo y reportes, accesibilidad y flexibilidad. |

Tabla . Determinación del Problema

## Determinación de la posición del producto

|  |  |
| --- | --- |
| **¿Para quién?** | Estudiantes de 2do y 3er grado de primaria. |
| **El nombre del producto** | Sharky Aprende |
| **¿Qué es?** | Plataforma educativa interactiva |

Tabla . Determinación de la posición del producto.

# Descripción de los interesados y usuarios

## Resumen de los interesados (stakeholders)

|  |  |  |
| --- | --- | --- |
| **Cargo** | **Representa** | **Rol** |
| Usuario final | Estudiantes de 2do y 3er grado. | Participar en el aprendizaje y proporcionar retroalimentación. |
| Educador | Maestros de primaria. | Facilitar el aprendizaje y monitorear el progreso. |

Tabla . Resumen de los stakeholders.

## Resumen de los usuarios

|  |  |
| --- | --- |
| **Nombre** | **Descripción** |
| Usuario final | Estudiantes de 2do y 3er grado usando la plataforma para aprender y jugar. |
| Usuario supervisor | Supervisar el uso de la plataforma y apoyar el aprendizaje. |

Tabla . Resumen de los usuarios.

## Ambiente del usuario

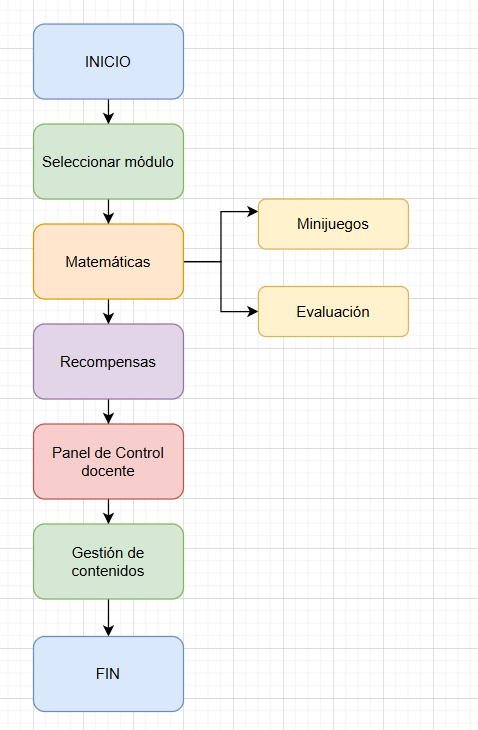
En la fase inicial, se espera que el equipo esté compuesto por aproximadamente 3 personas, incluyendo desarrollador, diseñador, y educador. Este número puede cambiar a medida que el proyecto crezca. El ciclo de la tarea para los usuarios (estudiantes y docentes) puede variar: cada sesión de juego puede durar entre 10 a 15 minutos, dependiendo de la actividad y el nivel de dificultad. Estos tiempos pueden cambiar según la implementación de nuevas funcionalidades, la adaptación del currículo y la retroalimentación de los usuarios. La plataforma "Sharky Aprende" se desarrollará para ser accesible en múltiples sistemas operativos. Tambien deberá integrarse con las aplicaciones existentes (Google Classroom, Microsoft Teams, o Moodle) para facilitar la gestión de clases, el seguimiento del progreso y la comunicación entre docentes y estudiantes.

## Perspectivas del juego

"Sharky Aprende" se posiciona en el mercado de plataformas educativas gamificadas, compitiendo con productos como Kahoot, Prodigy Math, y ABCmouse. Nuestro proyecto combina la gamificación con un enfoque personalizado en matemáticas y lenguaje, utilizando un personaje amigable (Sharky) que guía a los estudiantes a través de juegos interactivos. La plataforma se adapta al nivel de habilidad del usuario, ofreciendo una experiencia de aprendizaje única y atractiva. El proyecto ofrecerá: minijuegos interactivos, evaluaciones personalizadas, un sistema de recompensas con puntos y logros, avatares personalizables. Para el control del docente tendrá Monitoreo del Progreso e informes detallados.

El proyecto se desarrollará como un sistema desde cero, lo que permitirá una personalización completa y la integración de las funcionalidades específicas que se han diseñado para satisfacer las necesidades de los estudiantes, docentes y padres. Esto también permitirá una mayor flexibilidad para futuras actualizaciones y mejoras.

**Diagrama de Flujo:**



### ***Figura 6: Estructura del Juego Sharky Aprende: Diagrama de Flujo***

## Licenciamiento e Instalación

"Sharky Aprende" se desarrollará bajo un modelo de licenciamiento propietario. Lo que significa que la plataforma será de uso exclusivo para los usuarios que adquieran una licencia, lo que permitirá un mayor control sobre la distribución y el uso del software. Se implementarán medidas de seguridad para proteger las cuentas de usuario, incluyendo autenticación de dos factores y políticas de contraseñas seguras. La plataforma requerirá una conexión a Internet para la activación de licencias y el acceso a contenido actualizado. Esto Significa que los usuarios deberán aceptar los términos de uso y las políticas de privacidad al registrarse. Se ofrecerá una versión basada en la web que permitirá a los usuarios acceder a la plataforma sin necesidad de instalación, lo que facilitará el acceso desde cualquier dispositivo con conexión a Internet.

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Version 3, 29 June 2007

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For example, if you distribute copies of such a program, whether

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Developers that use the GNU GPL protect your rights with two steps:

(1) assert copyright on the software, and (2) offer you this License

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For the developers' and authors' protection, the GPL clearly explains

that there is no warranty for this free software. For both users' and

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Some devices are designed to deny users access to install or run

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The precise terms and conditions for copying, distribution and

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"This License" refers to version 3 of the GNU General Public License.

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"The Program" refers to any copyrightable work licensed under this

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A "covered work" means either the unmodified Program or a work based

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To "propagate" a work means to do anything with it that, without

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To "convey" a work means any kind of propagation that enables other

parties to make or receive copies. Mere interaction with a user through

a computer network, with no transfer of a copy, is not conveying.

An interactive user interface displays "Appropriate Legal Notices"

to the extent that it includes a convenient and prominently visible

feature that (1) displays an appropriate copyright notice, and (2)

tells the user that there is no warranty for the work (except to the

extent that warranties are provided), that licensees may convey the

work under this License, and how to view a copy of this License. If

the interface presents a list of user commands or options, such as a

menu, a prominent item in the list meets this criterion.

1. Source Code.

The "source code" for a work means the preferred form of the work

for making modifications to it. "Object code" means any non-source

form of a work.

A "Standard Interface" means an interface that either is an official

standard defined by a recognized standards body, or, in the case of

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is widely used among developers working in that language.

The "System Libraries" of an executable work include anything, other

than the work as a whole, that (a) is included in the normal form of

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"Major Component", in this context, means a major essential component

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(if any) on which the executable work runs, or a compiler used to

produce the work, or an object code interpreter used to run it.

The "Corresponding Source" for a work in object code form means all

the source code needed to generate, install, and (for an executable

work) run the object code and to modify the work, including scripts to

control those activities. However, it does not include the work's

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which are not part of the work. For example, Corresponding Source

includes interface definition files associated with source files for

the work, and the source code for shared libraries and dynamically

linked subprograms that the work is specifically designed to require,

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subprograms and other parts of the work.

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keep intact all notices of the absence of any warranty; and give all

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You may charge any price or no price for each copy that you convey,

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5. Conveying Modified Source Versions.

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terms of section 4, provided that you also meet all of these conditions:

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it, and giving a relevant date.

b) The work must carry prominent notices stating that it is

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in an aggregate does not cause this License to apply to the other

parts of the aggregate.

6. Conveying Non-Source Forms.

You may convey a covered work in object code form under the terms

of sections 4 and 5, provided that you also convey the

machine-readable Corresponding Source under the terms of this License,

in one of these ways:

a) Convey the object code in, or embodied in, a physical product

(including a physical distribution medium), accompanied by the

Corresponding Source fixed on a durable physical medium

customarily used for software interchange.

b) Convey the object code in, or embodied in, a physical product

(including a physical distribution medium), accompanied by a

written offer, valid for at least three years and valid for as

long as you offer spare parts or customer support for that product

model, to give anyone who possesses the object code either (1) a

copy of the Corresponding Source for all the software in the

product that is covered by this License, on a durable physical

medium customarily used for software interchange, for a price no

more than your reasonable cost of physically performing this

conveying of source, or (2) access to copy the

Corresponding Source from a network server at no charge.

c) Convey individual copies of the object code with a copy of the

written offer to provide the Corresponding Source. This

alternative is allowed only occasionally and noncommercially, and

only if you received the object code with such an offer, in accord

with subsection 6b.

d) Convey the object code by offering access from a designated

place (gratis or for a charge), and offer equivalent access to the

Corresponding Source in the same way through the same place at no

further charge. You need not require recipients to copy the

Corresponding Source along with the object code. If the place to

copy the object code is a network server, the Corresponding Source

may be on a different server (operated by you or a third party)

that supports equivalent copying facilities, provided you maintain

clear directions next to the object code saying where to find the

Corresponding Source. Regardless of what server hosts the

Corresponding Source, you remain obligated to ensure that it is

available for as long as needed to satisfy these requirements.

e) Convey the object code using peer-to-peer transmission, provided

you inform other peers where the object code and Corresponding

Source of the work are being offered to the general public at no

charge under subsection 6d.

A separable portion of the object code, whose source code is excluded

from the Corresponding Source as a System Library, need not be

included in conveying the object code work.

A "User Product" is either (1) a "consumer product", which means any

tangible personal property which is normally used for personal, family,

or household purposes, or (2) anything designed or sold for incorporation

into a dwelling. In determining whether a product is a consumer product,

doubtful cases shall be resolved in favor of coverage. For a particular

product received by a particular user, "normally used" refers to a

typical or common use of that class of product, regardless of the status

of the particular user or of the way in which the particular user

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is a consumer product regardless of whether the product has substantial

commercial, industrial or non-consumer uses, unless such uses represent

the only significant mode of use of the product.

"Installation Information" for a User Product means any methods,

procedures, authorization keys, or other information required to install

and execute modified versions of a covered work in that User Product from

a modified version of its Corresponding Source. The information must

suffice to ensure that the continued functioning of the modified object

code is in no case prevented or interfered with solely because

modification has been made.

If you convey an object code work under this section in, or with, or

specifically for use in, a User Product, and the conveying occurs as

part of a transaction in which the right of possession and use of the

User Product is transferred to the recipient in perpetuity or for a

fixed term (regardless of how the transaction is characterized), the

Corresponding Source conveyed under this section must be accompanied

by the Installation Information. But this requirement does not apply

if neither you nor any third party retains the ability to install

modified object code on the User Product (for example, the work has

been installed in ROM).

The requirement to provide Installation Information does not include a

requirement to continue to provide support service, warranty, or updates

for a work that has been modified or installed by the recipient, or for

the User Product in which it has been modified or installed. Access to a

network may be denied when the modification itself materially and

adversely affects the operation of the network or violates the rules and

protocols for communication across the network.

Corresponding Source conveyed, and Installation Information provided,

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# Características del juego

## Característica 1

**Sistema de Minijuegos Educativos Interactivos:**

* Se desarrollarán diversos minijuegos diseñados para reforzar habilidades básicas de matemáticas. Estos juegos serán atractivos y adaptativos, ofreciendo diferentes niveles de dificultad para ajustarse al progreso de cada estudiante.

## Característica 2

**Panel de Progreso y Reportes en Tiempo Real para Docentes:**

* La plataforma contará con una vista especializada para los docentes, que les permitirá monitorear el desempeño de sus estudiantes en tiempo real. Se mostrarán estadísticas como aciertos, errores y progreso individual para facilitar un seguimiento efectivo del aprendizaje.

## Característica 3

**Sistema de Puntos y Recompensas Personalizadas:**

* Se implementará un sistema de gamificación que otorgue puntos y recompensas virtuales a los estudiantes según su rendimiento en los minijuegos. Esto incentivará la motivación y el compromiso con las actividades educativas.