JOURNAL of NON-FORMAL and DIGITAL EDUCATION

Augmented Reality in the classroom: Quiver App, a creative tool for interactive learning

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Abstract. This article explores the integration of augmented reality (AR) in primary and early childhood education through the Quiver app, an innovative digital tool that transforms traditional colouring activities into interactive three-dimensional experiences. The study aims to demonstrate how AR can enhance learning by increasing engagement, improving retention, and fostering multisensory learning. The research employs a case study approach, analysing the implementation of Quiver in interdisciplinary lessons, including science, visual arts, and early literacy and numeracy activities. Data collection was based on classroom observations, pupil self-assessment, and internal surveys measuring motivation, participation, and learning outcomes.

Findings indicate that the use of Quiver significantly increased pupil motivation and active participation, particularly among children with concentration difficulties or non-traditional learning styles. Pupils demonstrated improved retention of key concepts, with 85% achieving top scores in assessments on the butterfly life cycle. The app's capacity to provide immediate visual and auditory feedback strengthened conceptual understanding and supported differentiated learning. Challenges such as the need for adequate mobile devices and stable internet connections are acknowledged, with recommendations for strategic planning and integration into broader pedagogical frameworks.

The article concludes that Quiver acts as a bridge between traditional teaching and digital innovation, supporting experiential learning and digital competence development. By merging play-based activities with technology, it offers teachers an effective, easy-to-implement method to enhance classroom engagement and achieve more impactful learning experiences.

Keywords: Augmented reality; Quiver app; Interactive learning; Primary education; Digital pedagogy.

1. Introduction

Educational technology has evolved rapidly in the last decade, providing teachers with increasingly interactive and engaging tools for use in the teaching process (Voinea & Șerban 2021). One of these resources is the Quiver app, which brings augmented reality (AR) into the classroom, transforming simple colouring sheets into dynamic three-dimensional experiences.

Quiver is a mobile application available for Android and iOS devices that combines the classic activity of colouring with AR technology. Pupils colour the sheets provided by the app, and then, using a mobile device's camera, those sheets come to life as interactive 3D animations.

How to cite:
Brătescu, M. (2025). Augmented Reality in the classroom: Quiver App, a creative tool for interactive learning. *Journal of Non-Formal and Digital Education*, 1(2), 7-11. DOI: https://doi.org/10.63734/JNFDE.01.02.002

Integrating Quiver into lessons can bring significant benefits, especially for primary and lower secondary pupils. Here are some practical examples:

- Science: Pupils can colour and explore 3D models of volcanoes, cells, or animals, observing processes such as eruptions or the water cycle in a visually engaging way.
- Geography: Colouring sheets that illustrate maps of the globe, continents, or weather phenomena offer three-dimensional representations that support conceptual understanding.
- Art and creativity: Quiver encourages artistic expression, as each pupil personalises the drawing which then comes to life—strengthening the connection between creative activity and immediate visual feedback.
- Civic or emotional education: Some sheets depict characters or situations that can be used in lessons about behaviour, empathy, and conflict resolution.

The digital apps offer multiple educational benefits that enhance the teaching and learning experience (Neagu, 2019). By bringing pupils' drawings to life, the app significantly increases motivation, fostering greater engagement and active participation during lessons. Its multisensory approach—combining visual, tactile, and auditory elements—caters to various learning styles, ensuring a richer and more memorable educational experience. Moreover, Quiver promotes inclusion by providing differentiated learning opportunities that can effectively support pupils with special needs, helping them engage with content in accessible and stimulating ways. The app also encourages interdisciplinarity, allowing teachers to design integrated lessons that creatively combine art, science, and technology, thereby cultivating both creative and analytical thinking in students (Gheorghe, 2020).

2. Research methodology

The research employed a qualitative case study methodology aimed at exploring the educational impact of the Quiver app in primary and early childhood settings. Two case studies were conducted: an interdisciplinary Science and Visual Arts lesson with Year 3 pupils focusing on the butterfly life cycle, and a literacy and numeracy activity with a reception class using 3D letters and numbers. Data collection methods included classroom observations, pupil self-assessment sheets, and informal surveys to capture engagement levels, participation, and concept retention. The analysis focused on identifying patterns of increased motivation, improved learning outcomes, and the effectiveness of multisensory approaches facilitated by augmented reality. This methodological design allowed for an in-depth understanding of how Quiver can enhance both traditional and digital teaching strategies while supporting diverse learning needs.

3. Results

The implementation of the Quiver app in classroom settings yielded notable outcomes, demonstrating its potential to enhance pupil engagement, motivation, and learning retention. The following case studies present the observed results, highlighting pupil responses, performance improvements, and the added value of integrating interactive digital tools into traditional teaching practices.

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3.1 Case study 1. Interdisciplinary lesson using Quiver in year 3

An integrated Science and Visual Arts lesson on the Life Cycle of Insects – the Butterfly.

Pupils received a dedicated Quiver sheet showing the stages of butterfly development: egg, larva (caterpillar), chrysalis, and adult. After colouring the sheet in their own way, they used tablets or smartphones to view a 3D animation of the butterfly's metamorphosis.

This activity was followed by a guided discussion on the biological changes at each stage, and pupils completed a self-assessment sheet, drawing and naming the four stages.

Observed results:

- All pupils actively participated, including those usually reluctant during theoretical lessons.
- Pupils retained concepts more easily, and in the final assessment of the unit, 85% achieved the highest score on the butterfly life cycle section.
- The activity was perceived as “fun” and “interesting” by most pupils, according to an internal survey.

3.2 Case study 2. 3D letters and numbers in reception class

For each new letter introduced, children coloured a special sheet that included the large-format letter and an associated object (e.g., “A” – aeroplane, “B” – balloon, “C” – cat). After colouring, they used the app to view the letter and object in 3D (Figure 1). The objects came to life and made corresponding sounds, reinforcing learning through visual-auditory association (QuiverVision, 2024).

Figure 1. Quiver interface

The same method was applied for learning numbers from 1 to 10. Each sheet featured the number and a group of objects representing the quantity (e.g., 3 apples, 5 fish), which became animated when viewed with Quiver. Pupils were encouraged to count aloud and talk about the colours and shapes observed.

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Observed results:

- Children showed increased interest in lessons and were actively involved in learning activities.
- Retention of letter sounds and shapes improved due to multisensory association.
- Pupils with concentration difficulties or visual learning styles responded much better to Quiver than to traditional exercises.
- The activity was successfully included in a digital portfolio, useful for parent communication and progress evaluation.

4. Discussion

The use of Quiver in early years education offers several advantages that contribute to a more engaging and effective learning experience. By combining colouring activities with augmented reality, the app promotes learning through play, creating a relaxed and enjoyable environment that is familiar to young children. This approach not only captures their attention but also encourages active participation. Additionally, the act of colouring supports the development of fine motor skills, while the digital component introduced by AR enhances their interaction with the content (European Schoolnet, 2018). Quiver also stimulates memory and focus, as children are more likely to retain letters, numbers, and concepts when these are associated with animated images and positive emotional experiences. Furthermore, the app provides flexibility in its use, being suitable for both classroom settings and home activities, whether for consolidation or remedial purposes, thus extending learning opportunities beyond the traditional classroom environment.

It is important that the Quiver app is used as a complementary tool, integrated into the teaching strategy—not as an end in itself. Careful preparation is also recommended: choosing appropriate sheets, organising group work (if devices are limited), and accompanying digital activities with reflection, verbalisation, and evaluation moments.

5. Conclusions and recommendations

The Quiver app can be a valuable aid for primary school teachers, particularly in teaching letters and numbers. By combining traditional elements with modern technology, education becomes more attractive, accessible, and effective for all children.

To use Quiver effectively, access to mobile devices (tablets or smartphones) and a stable internet connection to download sheets is required. Activities should be well-planned, and pupils should be familiarised with how to use the app.

Quiver represents a bridge between traditional learning and innovation, enhancing lessons through augmented reality. In a constantly evolving educational context, such tools can support the development of digital competencies and experiential learning.

Smart integration of technology in the educational process is not just a trend but a necessity. Quiver offers teachers a creative, easy-to-implement, and effective way to capture pupils' interest and promote authentic learning.

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In a world where digitalisation is increasingly present in children's lives, it is essential to use technology creatively and pedagogically. Quiver is a good practice example in this regard.

6. References

European Schoolnet. (2018). *Augmented reality in education: A toolkit for teachers*. https://www.eun.org

Gheorghe, C. M. (2020). *Primary education didactics in the digital era*. Pro Universitaria Publishing House.

Neagu, M. (2019). Use of mobile applications in the teaching-learning process in primary grades. *Didactica Nova Journal*, 32(2), 45–49.

QuiverVision. (2024). Quiver – *3D colouring app with augmented reality*. https://quivervision.com

Voinea, C. L., & Șerban, M. (2021). *Technology in education: Between challenges and opportunities*. Universitara Publishing House.

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