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VIRTUAL REALITY (VR) TECHNOLOGIES IN FORMING TOURISM PERCEPTIONS AMONG PRIMARY SCHOOL STUDENTS

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Abstract. Primary school teachers who want to widen their pupils' sense of the world beyond the classroom run into a familiar obstacle: real excursions are expensive, time-consuming, and often beyond what a family can arrange. This paper examines whether virtual reality (VR) can substitute, at least partially, for the direct experience of place in building what we term "tourism perception" — a child's knowledge-based, emotionally coloured image of a region's nature, history, and culture. Working from a comparative reading of recent foreign and Uzbek sources rather than from original fieldwork, the paper sets out a five-component pedagogical model, "Virtual Journey Across Uzbekistan," together with the stages through which a lesson built on it might proceed and the criteria by which suitable VR material could be chosen. The discussion does not treat VR uncritically: cost, teacher readiness, and open questions about eye and vestibular strain in young children are weighed alongside the technology's advantages. The model is offered as a starting point for classroom experimentation rather than as a validated intervention.

Keywords. Virtual reality; VR in education; tourism perception; primary school pedagogy; immersive learning; virtual excursion; patriotic upbringing.

ТЕХНОЛОГИИ ВИРТУАЛЬНОЙ РЕАЛЬНОСТИ (VR) В ФОРМИРОВАНИИ ТУРИСТСКИХ ПРЕДСТАВЛЕНИЙ У УЧАЩИХСЯ НАЧАЛЬНЫХ КЛАССОВ

Аннотация. Учителя начальных классов, стремящиеся расширить кругозор учеников за пределы учебника, сталкиваются с известным ограничением: организация реальных поездок требует средств, времени и возможностей, которыми располагает далеко не каждая семья. В статье рассматривается, в какой мере технология виртуальной реальности (VR) способна частично компенсировать отсутствие непосредственного опыта места при формировании так называемого туристского представления — образного, эмоционально окрашенного знания ребёнка о природе, истории и культуре региона. Опираясь на сопоставительный анализ зарубежных и отечественных источников последних лет, а не на собственное эмпирическое исследование, автор предлагает пятикомпонентную педагогическую модель «Виртуальное путешествие по Узбекистану», описывает возможную последовательность этапов урока, построенного на её основе, и формулирует критерии отбора VR-материала. Технология рассматривается без излишней идеализации: наряду с её

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преимуществами обсуждаются стоимость оборудования, уровень готовности педагогов и открытые вопросы о влиянии длительного использования VR на зрение и вестибулярный аппарат детей. Предложенная модель мыслится как отправная точка для апробации в классе, а не как уже проверенное решение.

Ключевые слова. Виртуальная реальность; VR в образовании; туристское представление; педагогика начальной школы; иммерсивное обучение; виртуальная экскурсия; патриотическое воспитание.

Introduction. Ask a primary school teacher in Uzbekistan how a child comes to feel something for Khiva or the Aral Sea without ever going there, and the honest answer is usually: a textbook photograph, a video clip, perhaps a story from a relative who has visited. None of these fully substitutes for standing in the place itself, and organising an actual class trip to a historical site several hundred kilometres away is, for most schools, simply not realistic — the cost, the logistics, and the safety requirements involved rule it out for all but a handful of occasions each year. Families vary considerably in what they can afford to arrange independently, which means the gap in children's firsthand exposure to their own country's heritage tends to track socio-economic circumstance rather than curiosity or aptitude.

Virtual reality is one of the more concrete answers digital education has produced to this problem. Unlike a video, which a child watches, VR is something a child is placed inside of — a distinction that matters pedagogically, not merely technically. Two questions follow from this, and they are not the same question. The first is practical: can a primary teacher, working with an ordinary class and a modest budget, actually build a lesson around VR that does more than entertain? The second is conceptual: what, precisely, would count as success — what is a "tourism perception," and how would one recognise that a child has formed one? This paper works through both, proposing a structured model rather than a general endorsement of the technology.

Research Methodology. The paper is conceptual rather than empirical: no VR lesson was piloted with students, and no data were collected from teachers or children. The task set for the study was narrower — to read across pedagogy, developmental psychology, and the growing body of VR-in-education literature closely enough to derive a workable model, specify its stages, and state criteria for the digital material a teacher would need to select. Four moves structure the analysis: a review of the relevant literature; a side-by-side comparison of how a conventional lesson and a VR-based one might unfold on the same topic; the construction, from that comparison, of a staged model; and, holding the whole together, a systems perspective on the grounds that a single VR session cannot by itself build a durable perception — that requires classroom instruction, follow-up activity, and digital resources working as one sequence rather than as isolated episodes.

This limitation is worth stating plainly rather than softening: the model proposed below has not been tested in a real classroom, and its practical value — whether it actually helps, and for which children — remains an open empirical question for future work.

Literature Review. The evidence base for VR in school settings has grown quickly enough that a 2025 systematic review could already draw on 34 empirical

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studies spanning the P-12 range; across them, VR use was associated with stronger reported presence, immersion, and gains on the so-called 4C skills — critical thinking, creativity, collaboration, communication [1]. Closer to the age group this paper is concerned with, a Helsinki-led study with 10– to 12-year-olds used immersive VR for an environmental-studies unit and recorded a clear rise in engagement compared with the conventional version of the lesson [2].

The picture is not uniformly favourable, however, and it would be misleading to present it as such. A 2025 survey of 309 school principals, teachers, and parents in Switzerland found real hesitation about adopting immersive VR, driven less by scepticism about the technology itself than by its cost, the technical burden of maintaining it, and uncertainty about whether the pedagogical payoff justifies either [3]. Research from the post-Soviet region has looked specifically at spatial and factual perception-building in younger children and reports VR as a motivational aid rather than a proven instructional method in its own right [4], while work in geography education has isolated immersion, interactivity, dynamism, and a sense of presence as the features doing most of the pedagogical work [5]. A related comparative study found measurable gains in both declarative and procedural knowledge following VR-based instruction, suggesting the benefits extend beyond engagement alone [6]. Read together, these sources support a cautiously specific claim: VR is plausible as a tool for primary-level tourism perception, provided its use is planned rather than improvised.

Defining "Tourism Perception". The term is used here in a specific sense that needs stating before the model can be evaluated. A tourism perception, as treated in this paper, is not simply factual recall ("Samarkand has the Registan") but a composite of three things that a good lesson would try to build together:

- a cognitive layer — accurate, place-specific knowledge of nature, history, and culture;
- an affective layer — some genuine feeling toward the place, whether wonder, pride, or attachment;
- an expressive layer — the ability to put the impression into a drawing, a short account, or a small project of one's own.

A lesson that produces only the first — facts without feeling or expression — has not, on this definition, produced a tourism perception at all, which is precisely where textbook text and static images tend to fall short: they inform without placing the child anywhere. A virtual excursion, built around a real site rendered virtually rather than around narrated description [11], is one way of closing that gap, and does so most obviously for places a class could never otherwise reach — a mountain range on another continent, say, or a heritage site well beyond the region's travel budget.

Why Age Matters Here. Piaget placed children of seven to eleven in the concrete-operational stage, where reasoning still leans heavily on tangible, visualisable material rather than on abstraction handled in the head [7]. A fortress or a mountain range is, for a child at this stage, much easier to grasp once seen than once described — which is less a claim about VR specifically than about imagery in general, but it does suggest VR is working with the grain of how children this age actually think, rather than against it.

Vygotsky's zone of proximal development supplies the second piece: what a child cannot yet do alone but can do with a well-placed tool or an adult's guidance is

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exactly where learning is most productive [8], and VR fits that description — it delivers an experience the child could not otherwise reach, but only becomes educative once a teacher shapes what happens before and after it. Dewey's insistence that learning sticks better when it grows out of active, felt experience rather than passive reception points the same way [9]. None of this, though, implies VR works equally well for every child; the literature is fairly consistent that pupils with stronger self-regulation and more intrinsic motivation get more out of an unstructured virtual environment, while others need considerably more scaffolding from the teacher to avoid the session becoming simply a novelty [10]. That asymmetry is itself an argument for keeping the teacher's role central rather than treating VR as something that can run on its own.

What VR Actually Offers a Lesson. Set against the alternative of a textbook page or a video clip, VR's didactic contribution comes down to a handful of concrete features rather than a vague sense of novelty [12]:

- immersion, which holds attention in a way a two-dimensional image rarely does;
- interactivity, which turns the child from a viewer into someone doing something — looking around, choosing where to go next;
- a degree of pacing control, since a pupil can linger on what interests them rather than following a fixed narration;
- access without the cost or risk of the real trip;
- a natural bridge between subjects — a single VR excursion can serve a natural-science lesson and an "Hour of the Future" session without much adaptation.

A Proposed Model: "Virtual Journey Across Uzbekistan"

The model sketched here — "Virtual Journey Across Uzbekistan" [13] — is meant as something a school could conceivably build toward, not a finished product. It would let pupils move through several of the country's regions (Samarkand, Bukhara, Khiva, the Fergana Valley, the Aral Sea basin, among others), see historical sites rendered in 3D, hear audio commentary, and complete short interactive tasks tied to whatever the class is studying that week. Its underlying purpose is unapologetically patriotic in the specific, modest sense of helping children know their own country better — not a claim to originality in method, but a statement of what the model is for.

Structurally, it rests on five components that need each other to function:

- a motivational-purpose layer, which is really just making sure the child wants to be there before the lesson starts;
- content, organised across four strands — nature and geography, history and heritage, culture and art, and present-day Uzbekistan;
- the technological layer — 360° panoramas and supporting multimedia — doing the actual delivery;
- an activity layer where pupils work individually, in pairs, or as a class on the interactive tasks;
- and an evaluation layer, without which a teacher has no way of knowing whether any of the above achieved anything.

A. How a Lesson Might Actually Run

In practice the sequence would look something like: settle on a topic and a clear objective; select material that fits it; run the virtual journey itself; follow it

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immediately with observation and discussion, while the impression is still fresh; give pupils a way to express what they took from it; and only then assess what, if anything, has stuck.

Concretely — a lesson titled "Beautiful Corners of My Homeland" might open with a two-minute 360° clip of Registan Square or Itchan Kala, after which pupils locate the site themselves on an interactive map rather than being told where it is. In small groups they take up a fairly simple prompt — "what would we actually see if we went there?" — and the lesson closes with each child turning their impression into a drawing or a short spoken account, since the expressive step is where the perception, on the definition used here, actually consolidates rather than merely being received. As a take-home extension, families could put together a small album, "My Dream Journey," gathering images and facts about a place in Uzbekistan the child would like to visit — not central to the model, but a low-cost way of extending it beyond the single lesson.

B. Choosing the Material

Not every 360° video or VR app marketed for schools is fit for this purpose, and the paper proposes six criteria a teacher might reasonably apply: fit with the lesson's actual objective, rather than being included because it exists; factual accuracy, with no historical or geographical errors that a later lesson would have to correct; language and pacing suited to the age group rather than adapted from adult content; a real level of interactivity, not passive video dressed up as VR; visual and audio quality good enough to sustain attention rather than distract from it; and a discernible connection to the patriotic-education aim the model is built around. Material failing several of these criteria risks becoming decoration — something that occupies a lesson slot without doing the pedagogical work the model asks of it.

Results. Three things came out of the analysis, and they are best read as connected rather than as separate findings. First, tourism perception is not a single thing to be transmitted but a structure with cognitive, affective, and expressive parts that a lesson needs to address separately. Second, forming it is not a one-step event but unfolds across a sequence — topic, material, journey, discussion, expression, evaluation — in which the discussion and expression stages arguably matter as much as the VR experience itself. Third, the choice of digital material is not incidental but governed by criteria that a teacher can apply in advance, which is what makes the model something other than a general endorsement of VR. Taken together, these give the "Virtual Journey Across Uzbekistan" model enough specificity to be tried, and enough structure to be evaluated, in future classroom work.

Discussion. The model's debts to the developmental literature are fairly direct rather than decorative. Moving from a visual, concrete stimulus toward a creative, expressive task tracks Piaget's account of how children this age actually process new material; closing each virtual journey with teacher-led discussion rather than leaving pupils with the VR experience alone follows from Vygotsky's point that a mediated experience only becomes developmental with adult guidance attached; and the observation-then-creation sequence is, more or less, Dewey's argument about experience-based learning applied to a specific classroom tool.

None of this should be read as an argument for adopting VR uncritically, and the literature reviewed above does not support one. The Swiss survey's finding of stakeholder caution and the self-regulation research's finding that VR benefits some

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pupils considerably more than others both push against treating the model as a ready-made solution; they suggest instead that it needs a teacher actively managing it rather than supervising it from a distance. The most significant limitation of the present analysis is the obvious one — it is a paper argument, not a classroom result — and the natural next step is a small-scale pilot with a defined school, class, and observation period, against which the model's claims could actually be checked rather than merely asserted.

Conclusion. The case for VR in forming tourism perceptions among primary pupils is reasonably strong on paper: it fits how children this age process new material, it offers access to places a class could never otherwise reach, and it does both without most of the risk and expense of a real excursion. It is not, on the evidence reviewed here, a technology that runs itself — cost, teacher preparation, and unresolved questions about extended use and children's vision and balance all argue for a gradual, supervised rollout rather than a rapid one. The model proposed in this paper is offered in that spirit: as a structure worth testing in an actual classroom, combined with real excursions and conventional teaching rather than replacing them, and subject to revision once it has been.

Recommendations

1. Keep initial VR sessions short — 10 to 15 minutes — and tie them directly into existing subjects such as "Hour of the Future" and "Natural Sciences" rather than treating them as a separate activity.
2. Start with the cheapest viable equipment — cardboard headsets and 360° video — and expand only once a school has evidence the approach is working for its own pupils.
3. Give teachers actual training and a written methodological guide before expecting them to run VR sessions independently.
4. Treat the post-session discussion and creative task as mandatory, not optional — the model's own logic suggests this is where the perception is actually consolidated.
5. Use VR alongside real excursions and museum visits rather than instead of them; the model is a supplement, not a substitute.
6. Track eye and vestibular effects of regular use through ordinary school health monitoring, and cap session length by age rather than by convenience.
7. Pilot the model in a small number of defined classrooms with a clear observation period before drawing conclusions about its effectiveness at scale.

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