

# Challenges 2017

Aprender nas nuvens, Learning in the clouds



Livro de atas

X Conferência Internacional de TIC na Educação - Challenges 2017

8, 9 e 10 de maio, Braga, Universidade do Minho

Maria João Gomes  
António José Osório  
António Luís Valente

Universidade do Minho. Centro de Competência

# Challenges 2017: Aprender nas Nuvens, Learning in the Clouds

(Atas da X Conferência Internacional de Tecnologias de Informação e Comunicação na  
Educação – Challenges 2017, realizada em Braga de 8 a 10 de maio de 2017)

## ORGANIZADORES

Maria João Gomes  
António José Osório  
António Luís Valente

## PRODUÇÃO

Centro de Competência em Tecnologias de Informação e Comunicação na Educação  
(CCTIC-IEUM)

*Font typeface: Open Sans*

U: [www.nonio.uminho.pt](http://www.nonio.uminho.pt)  
E: [centrodecompetencia@ie.uminho.pt](mailto:centrodecompetencia@ie.uminho.pt)

## ISBN

978-989-97374-5-7

## EDIÇÃO

Universidade do Minho. Centro de Competência  
Campus de Gualtar  
4710-057 Braga, Portugal  
Maio, 2017



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

## SECRETARIADO

António Luís Valente  
Ana Paula Alves  
Ângela Ramos  
Aline Bettin de Oliveira  
Ana Cecília Hilário  
Ana Francisca Monteiro  
Catarina Liane Araújo  
Daniela Veiga de Oliveira  
Delfim Macedo  
Elisabete Barros  
Fábio Batalha Barros  
Fernando Luís Gonçalves  
Marcelo Brites  
Margarida Silva Franco  
Maribel Miranda  
Pilar Ibañez-Cubillas  
Rogéria Ramos  
Sílvia Saramago  
Vanêssa Mendes

## APOIO GRÁFICO

Ângela Ramos

## COMISSÃO ORGANIZADORA DA CONFERÊNCIA

Altina Ramos, IE, Universidade do Minho, Portugal  
Ana Paula Alves, CCTIC-IE Universidade do Minho, Portugal  
António José Osório, IE, Universidade do Minho, Portugal  
António Luís Valente, CCTIC-IE Universidade do Minho, Portugal  
Bento Duarte da Silva, IE, Universidade do Minho, Portugal  
Maria João Gomes, IE, Universidade do Minho, Portugal

## COMISSÃO CIENTÍFICA

Ádila Faria, Universidade do Minho, Portugal  
Adriana Gewerc Barujel, Universidade de Santiago de Compostela, Espanha  
Adriana Mendonça, Universidade de Cabo Verde, Cabo Verde  
Alda Pereira, Universidade Aberta, Portugal  
Aldo M. Passarinho, Instituto Politécnico de Beja, Portugal  
Alessandra Alcântara Velázquez, Universidade de Fortaleza, Brasil  
Altina Ramos, Universidade do Minho, Portugal  
Ana Amélia Carvalho, Universidade de Coimbra, Portugal  
Ana Francisca Monteiro, CIEd Universidade do Minho, Portugal  
Ana Margarida Almeida, Universidade de Aveiro, Portugal  
Ana Paula Alves, CCTIC Universidade do Minho, Portugal  
Ana Paula Correia, The Ohio State University, USA  
Anabela Gomes, Instituto Superior de Engenharia de Coimbra, Portugal  
Anabela Mesquita, Instituto Politécnico do Porto, Portugal  
Ângelo de Jesus, Instituto Politécnico do Porto, Portugal  
António Augusto Moreira, Universidade de Aveiro, Portugal  
Antonio Bartolomé, Universitat de Barcelona, Espanha  
António Dias Figueiredo, Universidade de Coimbra, Portugal  
António José Mendes, Universidade de Coimbra, Portugal  
António José Osório, Universidade do Minho, Portugal  
António Luís Valente, CCTIC Universidade do Minho, Portugal  
António Moreira Teixeira, Universidade Aberta, Portugal  
Belmiro Rego, Instituto Politécnico de Viseu, Portugal  
Bento Duarte da Silva, Universidade do Minho, Portugal  
Carla Morais, Universidade do Porto, Portugal  
Carlos Gomes, Universidade de Coimbra, Portugal  
Carlos Morais, Instituto Politécnico de Bragança, Portugal  
Carlos Nogueira Fino, Universidade da Madeira, Portugal  
Carlos Rodriguez-Hoyos, Universidade de Cantabria, Espanha  
Carlos Vaz de Carvalho, Instituto Superior de Engenharia do Porto, Portugal  
Clara Pereira Coutinho, Universidade do Minho, Portugal  
Cláudia Moderno, Universidade do Minho, Portugal  
Conceição Lopes, Universidade de Aveiro, Portugal  
Cristina Azevedo Gomes, Instituto Politécnico de Viseu, Portugal  
Cristina Manuela Sá, Universidade de Aveiro, Portugal  
Cristina Ponte, Universidade Nova de Lisboa, Portugal  
Daniela Gonçalves, Escola Superior de Educação Paula Frassinetti, Portugal  
Daniela Melaré Vieira Barros, Universidade Aberta, Portugal  
Edméa Santos, Universidade do Estado do Rio de Janeiro, Brasil  
Elsa Fernandes, Universidade da Madeira, Portugal  
Fernanda Maria Pereira Freire, Universidade Estadual de Campinas, Brasil  
Fernando Albuquerque Costa, Instituto de Educação da Universidade de Lisboa, Portugal  
Fernando Carrapiço, Universidade do Algarve, Portugal  
Fernando Moreira, Universidade Portucalense, Portugal  
Fernando Ramos, Universidade de Aveiro, Portugal  
Francisco de Paula Rodríguez Miranda, Universidad de Extremadura, Portugal  
Helena Peralta, Universidade de Lisboa, Portugal  
Henrique Gil, Instituto Politécnico de Castelo Branco, Portugal  
Irene Tomé, Universidade Nova de Lisboa, Portugal  
Isa Beatriz Neves, Universidade do Estado da Bahia, Brasil  
Isa de Jesus Coutinho, Universidade do Estado da Bahia, Brasil  
Isabel Cabrita, Universidade de Aveiro, Portugal  
Isabel Chagas, Instituto de Educação da Universidade de Lisboa, Portugal  
Isolina Oliveira, Universidade Aberta, Portugal

Izabel Meister, Universidade Federal de São Paulo, Brasil  
Jesus Maria Sousa, Universidade da Madeira, Portugal  
João Correia de Freitas, Universidade Nova de Lisboa, Portugal  
João Paiva, Universidade do Porto, Portugal  
José Alberto Lencastre, Universidade do Minho, Portugal  
José Armando Valente, Universidade Estadual de Campinas, Brasil  
José Bidarra, Universidade Aberta, Portugal  
José Duarte, Escola Superior de Educação de Setúbal, Portugal  
José Henrique Portela, Instituto Politécnico de Viana do Castelo, Portugal  
José Luís Carvalho, Universidad de Extremadura, Espanha  
José Luís Ramos, Universidade de Évora, Portugal  
José Reis Lagarto, Universidade Católica Portuguesa, Portugal  
Leonel Morgado, Universidade Aberta, Portugal  
Lia Raquel Oliveira, Universidade do Minho, Portugal  
Lina Morgado, Universidade Aberta, Portugal  
Livia Andrade Coelho, Universidade Federal da Bahia, Brasil  
Lúcia Amante, Universidade Aberta, Portugal  
Luís Filipe Barbeiro, Instituto Politécnico de Leiria, Portugal  
Luís Marqués Molías, Universitat de Rovira i Virgili, Espanha  
Luís Pedro, Universidade de Aveiro, Portugal  
Luís Tinoca, Universidade de Lisboa, Portugal  
Luísa Miranda, Instituto Politécnico de Bragança, Portugal  
Lurdes Martins, Instituto Politécnico de Viseu, Portugal  
Manuel Meirinhos, Instituto Politécnico de Bragança, Portugal  
Marcelo Mendonça Teixeira, Universidade Federal Rural de Pernambuco, Brasil  
Marcelo Vera Cruz Diniz, Instituto Federal de Educação, Ciência e Tecnologia da Bahia, Brasil  
Marco Silva, Universidade do Estado do Rio de Janeiro, Brasil  
Maria Elizabeth Bianconcini de Almeida, Pontifícia Universidade Católica de São Paulo, Brasil  
Maria Helena Menezes, Universidade de Lisboa, Portugal  
Maria João Gomes, Universidade do Minho, Portugal  
Maria João Horta, Centro de Competência TIC EDUCOM, Portugal  
Maria João Loureiro, Universidade de Aveiro, Portugal  
Maria José Loureiro, CCTIC Universidade de Aveiro, Portugal  
Maria José Machado, Universidade do Minho, Portugal  
Maria José Marcelino, Universidade de Coimbra, Portugal  
Maria Raquel Patrício, Instituto Politécnico de Bragança, Portugal  
Maria Santa-Clara Barbas, Instituto Politécnico de Santarém, Portugal  
Maribel Miranda Pinto, Universidade do Minho, Portugal  
Marilei Fiorelli, Universidade Federal do Recôncavo da Bahia, Brasil  
Neuza Pedro, Universidade de Lisboa, Portugal  
Patrícia Fidalgo, Emirates College for Advanced Education, Emiratos Árabes Unidos  
Paulo Dias, Universidade Aberta, Portugal  
Paulo Faria, Escola Básica e Secundária de Vila Cova, Portugal  
Pedro Santos Silva, Universidade Federal da Bahia, Brasil  
Prudencia Gutiérrez-Esteban, Universidade de Extremadura, Espanha  
Rui Teles, Instituto Politécnico do Porto, Portugal  
Susana Ester Kruger Dissenha, Centro Universitário Senac, Brasil  
Tânia Maria Hetkowski, Universidade do Estado da Bahia, Brasil  
Teresa Bettencourt, Universidade de Aveiro, Portugal  
Teresa Cardoso, Universidade Aberta, Portugal  
Teresa Pessoa, Universidade de Coimbra, Portugal  
Teresa Sofia Castro, Universidade do Minho, Portugal  
Tiago Caldas Nunes, Instituto Politécnico de Beja, Portugal  
Vito José Carioca, Instituto Politécnico de Beja, Portugal  
Vitor Duarte Teodoro, Universidade Nova de Lisboa, Portugal

# ÍNDICE

<i>Nota de abertura</i> .....	13
-------------------------------	----

I

## TECNOLOGIAS EMERGENTES E AMBIENTES DIGITAIS DE APRENDIZAGEM

<i>Ambientes digitais de aprendizagem – o espaço das famílias em Portugal</i> .....	17
<i>Metodologias ativas apoiadas por recursos digitais: Usando os aplicativos Prezi e Plickers</i> .....	23
<i>Comunicação escola-família através da plataforma Edmodo: Qual a avaliação dos alunos?</i> .....	41
<i>Construção e avaliação de um ambiente virtual de ensino e aprendizagem autoformativo</i> .....	59
<i>O contributo das redes sociais académicas para o campo científico brasileiro na área de ciência da informação</i> .....	79
<i>Presencia en redes sociales y características de grupos de atención temprana</i> ...	97
<i>Bibliotecas universitárias inclusivas brasileiras e portuguesas: Acessibilidade e tecnologias de apoio</i> .....	113
<i>A integração da tecnologia no ensino de língua inglesa no ensino superior</i> .....	127
<i>Aplicações móveis para a aprendizagem de línguas e Jogos digitais: Estudo exploratório com alunos do ensino secundário</i> .....	143
<i>Crachás: Como usar em contexto educativo?</i> .....	157
<i>Contributo para o estudo da Identidade Digital: O caso de uma comunidade de investigadores juniores</i> .....	175
<i>Matemática com a app Milage Aprender+</i> .....	195

<i>Conferências online – um espaço de aprendizagem significativa.....</i>	<i>207</i>
<i>Conexões entre os ambientes digitais e a aprendizagem de estudantes com transtorno do espectro do autismo: Uma revisão sistemática da literatura.....</i>	<i>227</i>
<i>Ambientes online de aprendizagem em contexto prisional: Flexibilidade, participação e inclusão de reclusas na sociedade de informação.....</i>	<i>243</i>
<i>O espaço físico multidisciplinar e multidimensional da nova sala de aula inclusiva: Resultados de um web survey aos Future Classroom Learning Labs .....</i>	<i>259</i>
<i>A escola para além do digital: Quatro elementos da leitura em movimento.....</i>	<i>275</i>
<i>Aprender livre em comunidade de aprendizagem online.....</i>	<i>295</i>
<i>Estilos de aprendizagem em ambientes virtuais: Cenários de investigação na educação superior .....</i>	<i>313</i>
<i>Práticas educativas nas salas de aula do futuro: Análise focalizada nas metodologias de ensino-aprendizagem.....</i>	<i>329</i>
<i>A articulação interdisciplinar e a regulação do esforço de aprendizagem em ambientes online .....</i>	<i>361</i>
<i>Processo de criação de uma plataforma educacional inovadora: Autoria no design e nos processos educacionais .....</i>	<i>387</i>
<i>Desenho de atividades de aprendizagem baseado no conceito de Aprender Com Tecnologias.....</i>	<i>407</i>
<i>Roteiro dos Descobrimentos: Um recurso educativo digital.....</i>	<i>425</i>
<i>Dispositivos móveis e formação docente: Mobilizando saberes .....</i>	<i>441</i>
<i>Trazer vida à sala de aula: Utilização inovadora de dispositivos móveis no processo educativo .....</i>	<i>459</i>
<i>Projeto FQcozinhamolecular – Física e Química do 10.º ano com o apoio do Instagram: Um estudo exploratório.....</i>	<i>473</i>
<i>Análise de um aplicativo móvel para o ensino de Libras na perspectiva da taxonomia digital de Bloom.....</i>	<i>501</i>

## Índice

<i>O potencial da Internet das Coisas no ensino básico e secundário .....</i>	<i>517</i>
<i>Jogos educacionais abertos:</i>	
<i>Uma experiência de pesquisa responsabilidade e inovação .....</i>	<i>535</i>
<i>Aprendizagem ou entretenimento? Uma análise do jogo Persevere .....</i>	<i>549</i>
<i>Jogos digitais e promoção de soft skills em jovens em risco:</i>	
<i>Desenvolvimento e testagem de um protótipo .....</i>	<i>565</i>
<i>Desenvolvimento de um jogo educativo digital para aprendizagem da Tabela Periódica.....</i>	<i>585</i>
<i>Use of videogames in higher education in Portugal: A literature review.....</i>	<i>605</i>
<i>Analysing library book orders using data mining .....</i>	<i>621</i>
<i>Virtual Programming Lab e Moodle Mobile: Ferramentas pedagógicas para aprendizagem da programação em contexto universitário .....</i>	<i>631</i>
<i>Nuevas percepciones con realidad aumentada para la enseñanza de las ciencias.....</i>	<i>649</i>
<i>O Facebook como integração entre o contexto formal e informal.....</i>	<i>671</i>
<i>Robôs para crianças em idade pré-escolar (3 a 6 anos).....</i>	<i>685</i>
<i>As Tecnologias de Informação e Comunicação na Comunicação Aumentativa e Alternativa: Um estudo em unidades de Educação Especial.....</i>	<i>703</i>
<i>MOOCs as heutagogical learning environments .....</i>	<i>721</i>
<i>REDA - Plataforma de Recursos Educativos Digitais Abertos.....</i>	<i>729</i>
<i>Evaluation of user satisfaction of educational information system .....</i>	<i>737</i>
<i>Do passado para o presente e futuro das tecnologias educativas em Cabo Verde.....</i>	<i>749</i>
<i>A utilização de aplicações móveis no ensino superior:</i>	
<i>Prevalência e perspetivas - o caso da Universidade de Aveiro .....</i>	<i>753</i>
<i>Cenários de aprendizagem com recurso a dispositivos móveis.....</i>	<i>763</i>

<i>Atividades gamificadas para abordar conteúdos matemáticos de nível superior: Uma proposta de pesquisa .....</i>	<i>775</i>
<i>A gamificação no ensino da informática.....</i>	<i>783</i>
<i>Projeto BeSafe – utilizar as redes sociais com responsabilidade e segurança.....</i>	<i>791</i>

II

INOVAÇÃO CURRICULAR E DE APRENDIZAGEM EM CONTEXTOS DIGITAIS

<i>Currículo, Tecnologias e Inovação em Educação: Sentidos e desafios.....</i>	<i>803</i>
<i>Khan Academy em Português .....</i>	<i>813</i>
<i>Utilização da Wikipédia por estudantes: Um estudo exploratório no ensino superior online .....</i>	<i>815</i>
<i>Sala de aula invertida com uso de tecnologias digitais: Um estudo sobre a percepção de alunos numa Universidade Pública do Maranhão .....</i>	<i>833</i>
<i>Do cenário musical de Pernambuco para a Wikipédia: A produção de verbetes.....</i>	<i>849</i>
<i>Ebook teclado acompanhamento da UFRGS: Ensino de instrumento musical na modalidade EaD.....</i>	<i>865</i>
<i>As práticas musicais no aprendizado multimídia.....</i>	<i>881</i>
<i>From and beyond gamified activities in Primary English Learning.....</i>	<i>897</i>
<i>Projeto individual progressivo e e-learning em Música.....</i>	<i>915</i>
<i>Contexto digital no ensino da Física.....</i>	<i>921</i>
<i>Currículo, autoformação e aprendizagem em contexto digital online.....</i>	<i>935</i>
<i>Ferramentas para avaliação musical e-learning.....</i>	<i>949</i>
<i>Autorregulação na escrita: Self-regulated Strategy Development e Tecnologias de Informação e Comunicação .....</i>	<i>953</i>
<i>O uso do computador no trabalho docente a partir de duas realidades.....</i>	<i>965</i>

## Índice

<i>Sala de aula invertida, ensino-aprendizagem na formação de professores</i> .....	981
<i>O papel da interação entre pares e da tecnologia na aprendizagem:</i> <i>Perceção de estudantes do ensino superior</i> .....	993
<i>O ProUCA e as mudanças na cultura escolar: A relação aluno-aluno</i> .....	1007
<i>Resolução de problemas e aprendizagem colaborativa:</i> <i>Entre lógicas didáticas e estratégias de aprendizagem na escola</i> .....	1021
<i>Social learning systems:</i> <i>Closing the gap between scholars and science educators</i> .....	1039
<i>Currículo inclusivo no contexto do ProUCA</i> .....	1045
<i>TIC, atos de currículo e aprendizagens em contextos informais:</i> <i>O que nos ensinam distintos espaços de convivência</i> .....	1061
<i>Ferramenta para organização e proposição de conteúdos</i> <i>para musicalização</i> .....	1075
<i>Inovação no currículo do ensino técnico profissional em Administração:</i> <i>Projetos e tecnologias educacionais</i> .....	1091
<i>Um dos jeitos brasileiros de fazer e-learning em Música</i> .....	1107
<i>Uso de drones programáveis para aprender programação</i> .....	1125
<i>O blended learning na formação contínua de magistrados:</i> <i>Avaliação de um modelo de formação para regime híbrido</i> <i>por parte de um grupo de formandos</i> .....	1139
<i>Comunicação por correio eletrónico e aprendizagem da língua:</i> <i>Contextos e interação com estudantes chineses</i> .....	1155
<i>Letramento informacional: Riscos na Internet</i> <i>e sustentabilidade educacional</i> .....	1171
<i>Formação do tutor a distância para o ensino e aprendizagem em rede</i> .....	1189
<i>Rede de pesquisa colaborativa Universidade Escola: Integração entre</i> <i>aprendizagens formal e não formal por meio de tecnologias</i> .....	1215
<i>Percursos formativos autopiéticos e educação aberta online</i> .....	1231

<i>Etwinning - da partilha de práticas à aprendizagem entre pares .....</i>	<i>1247</i>
<i>A Escola Expandida, proposta de ecologia dos saberes para outras pedagogias e currículo .....</i>	<i>1263</i>
<i>Uso do Cisco Packet Tracer no modelo Flipped Classroom .....</i>	<i>1281</i>
<i>O uso de recursos computacionais na educação.....</i>	<i>1301</i>
<i>Pokemon Go: Público, privado e implicações na vida cotidiana .....</i>	<i>1317</i>
<i>Fóruns de discussão e aprendizagem colaborativa no ensino superior: Representações de estudantes.....</i>	<i>1329</i>
<i>The teacher education reform in Mongolia.....</i>	<i>1343</i>
<i>Avaliação de alunos: Um modelo de formação de professores para a melhoria das aprendizagens em b-learning no 3.º ciclo e secundário.....</i>	<i>1355</i>
<i>Inovação e tecnologias: A visão de estudantes em formação .....</i>	<i>1371</i>
<i>Percepções e atitudes de professores frente às TDIC no cotidiano e na ação docente: Estudo de caso com professores cursistas de formação a distância no Brasil.....</i>	<i>1385</i>
<i>Será que a utilização das TIC irá culminar na colaboração entre professores envolvidos em uma formação?.....</i>	<i>1401</i>
<i>Práticas pedagógicas inovadoras num curso de formação de um EduLab com recurso a tecnologias no ensino básico .....</i>	<i>1417</i>
<i>A aprendizagem é individual, mas ninguém aprende sozinho – uma experiência de formação on-line para docentes on-line.....</i>	<i>1431</i>
<i>A abordagem “learning by design” e a situacionalidade docente em TPACK ....</i>	<i>1449</i>
<i>A disseminação do TPACK em eventos científicos em Portugal.....</i>	<i>1469</i>
<i>O blog Tecnologia na Educação na formação continuada do professor.....</i>	<i>1489</i>
<i>Educação e integração de tecnologias digitais.....</i>	<i>1503</i>
<i>Initial teachers’ education practices within a technology enriched learning environment: Project FTE-Lab.....</i>	<i>1523</i>

## Índice

<i>Utilização do vídeo na Flipped Classroom e no b-e-Learning.....</i>	<i>1541</i>
<i>Narrativas digitais no desenvolvimento da linguagem oral por meio de projetos colaborativos em rede.....</i>	<i>1555</i>
<i>Programação tangível para crianças: MI-GO.....</i>	<i>1571</i>
<i>O aplicativo Kahoot na educação: Verificando os conhecimentos dos alunos em tempo real.....</i>	<i>1587</i>
<i>Revisão sistemática de literatura sobre o uso do celular no ensino da Geografia: O que apontam os estudos?.....</i>	<i>1603</i>
<i>Autoria e coautoria no contexto de práticas educacionais abertas no ensino superior.....</i>	<i>1619</i>
<i>Exploração de RED com alunos com NEE.....</i>	<i>1635</i>
<i>Views on the usefulness of animated infographics for learning and teaching Biology.....</i>	<i>1661</i>
<i>Integração das TIC em sala de aula: O que pensam os professores.....</i>	<i>1673</i>
<i>“c@iFM”- rádio na escola, tecnologias e inovação curricular.....</i>	<i>1683</i>
<i>Alfabetización mediática e informacional e inclusión social, en ambientes de aprendizaje no formal con arte y comunicación.....</i>	<i>1693</i>
<i>Da integração à inclusão na educação em Cabo Verde: Desafios e perspectivas.....</i>	<i>1703</i>
<i>Percursos da educação em Cabo Verde: Pensando hoje o amanhã.....</i>	<i>1707</i>
<i>Eportfólios e avaliação na educação pré-escolar: Vantagens e constrangimentos perspectivados por Educadoras de Infância.....</i>	<i>1711</i>
<i>Estudo, implementação e análise de uma plataforma on-line para ensino e formação a distância de grandes audiências no contexto português... </i>	<i>1719</i>
<i>O contributo do uso das tecnologias para um ensino inovador: O caso do modelo EduLab.....</i>	<i>1731</i>
<i>Explorar o ciclo da vinha: As crianças como repórteres.....</i>	<i>1739</i>

<i>Desenvolvimento de um framework para MOOC na formação contínua docente.....</i>	<i>1745</i>
<i>Um modelo de formação para o TPACK à luz da complexidade, flexibilidade cognitiva e Flipped Classroom .....</i>	<i>1751</i>
<i>Formação de professores em tempos de cibercultura: Um relato de experiência.....</i>	<i>1757</i>
<i>Três anos da iniciativa Laboratórios de Aprendizagem .....</i>	<i>1765</i>

III

AVALIAÇÃO DE APRENDIZAGENS E DE DISPOSITIVOS EM CONTEXTOS  
DIGITAIS

<i>Desafios e potencialidades da era digital na educação e na avaliação.....</i>	<i>1773</i>
<i>Aprender con videojuegos: Instrumento para evaluar las habilidades desarrolladas en contextos lúdicos digitales.....</i>	<i>1789</i>
<i>Estudos de design para estruturar sistemas de interação e navegação em livros digitais: Uma revisão sistemática da literatura .....</i>	<i>1799</i>
<i>A avaliação formativa digital. Projeto de intervenção numa escola .....</i>	<i>1821</i>
<i>Avaliar software educacional: Uma necessidade dos governos, das organizações e da sociedade civil.....</i>	<i>1835</i>
<i>Formação para a docência online: As nuances reveladas por um mapeamento sistemático de literatura.....</i>	<i>1847</i>
<i>Um comparativo de métodos de usabilidade pedagógica em ambientes virtuais de aprendizagem .....</i>	<i>1865</i>
<i>Uma análise da relação da usabilidade pedagógica com o modelo UTAUT nos processos de adoção de LMS no ensino superior .....</i>	<i>1885</i>
<i>O contributo das Tecnologias da Informação e da Comunicação na melhoria das aprendizagens: Perspetivas dos alunos .....</i>	<i>1909</i>

## NOTA DE ABERTURA

A conferência Challenges comemora em 2017 a sua décima edição, consolidando, assim, o reconhecimento como um dos mais significativos eventos no âmbito da educação com as novas tecnologias em Portugal. Ao longo destas dez edições a Challenges afirma-se como um marco indelével na agenda dos investigadores, educadores e professores portugueses de todos os níveis de ensino, formando uma comunidade dinâmica que, recorrentemente, traz consigo novos colegas. A cada edição, a Challenges conquista novos “adeptos” e expande-se além-fronteiras, chegando à generalidade dos países lusófonos e a outros, como a Espanha ou a Venezuela, o Reino Unido ou a Mongólia, tornando-se num espaço de debate intercontinental!

A X Conferência Internacional de Tecnologias de Informação e Comunicação na Educação – Challenges 2017, recebeu mais de 200 participantes, para além de oradores convidados e membros das diversas comissões, e contou com a apresentação pública de 109 comunicações orais e 22 apresentações em formato poster, cujos textos se publicam neste livro de atas. No contexto de uma sociedade cada vez mais digital, o envolvimento de cerca de 300 autores faz com que a Challenges se afirme como um espaço de partilha e de reflexão no domínio da investigação e da inovação educacional relacionada com as Tecnologias de Informação e Comunicação.

O lema “Aprender nas nuvens, Learning in the clouds”, adotado nesta décima edição da Challenges, impõe-se pelas referências tecnológicas implícitas que nos remetem para a computação e para a aprendizagem em rede e na rede e para a mobilidade, mas, “Aprender nas nuvens, Learning in the clouds”, pelo seu plural, remete-nos também para leituras adicionais, para outros significados.

“Aprender nas nuvens, Learning in the clouds”, por similitude com “andar nas nuvens”, remete-nos para a esfera do sonho e da fantasia, da paixão e do entusiasmo. Com “Aprender nas nuvens, Learning in the clouds” é a esse entusiasmo que quisemos prestar homenagem. O entusiasmo de aprender numa sociedade em constante mudança, num tempo em que o potencial das tecnologias nos leva para mundos muito diversos.

Esperamos que todos se tenham sentido nas nuvens!

A todos os que nos honraram com a sua presença e aos autores que submeteram os seus estudos, reflexões e projetos, tal como àqueles que, sendo participantes habituais, não puderam acompanhar-nos este ano, e aos que pela primeira vez participaram na Challenges queremos dizer... contamos convosco na Challenges 2019 para celebrar 20 anos de desafios!

Maria João Gomes

António José Osório

António Luís Valente

# FROM AND BEYOND GAMIFIED ACTIVITIES IN PRIMARY ENGLISH LEARNING

Suzette Oliveira, Universidade do Porto, suzette\_74@hotmail.com  
Mário Cruz, Politécnico do Porto, mariocruz@me.com

## Resumo

Alguns estudos relacionados com a implementação da pedagogia da gamificação começaram a surgir, tanto relacionados com contextos de aprendizagem do ensino básico como secundário, já começaram a surgir, centrando-se nos caminhos a seguir no que concerne o uso deste tipo de abordagem para a promoção do desenvolvimento de competências do século XXI (Cruz & Orange, 2016). No entanto, pouco se tem visto sobre os efeitos das tarefas gamificadas nos alunos do 1º CEB, especialmente em relação ao seu incentivo da competitividade e do pensamento crítico. Este trabalho tem como objetivo discutir a implementação de tarefas gamificadas na aprendizagem de inglês no 1º CEB. Seguindo uma abordagem metodológica etnográfica, observámos práticas gamificadas com um grupo de alunos que aprendem Inglês no 3º / 4º anos, em que foram convidados a: responder questionários, desenvolver trabalhos de projeto, realizar pequenos *roleplays*, analisar criticamente livros ilustrados, etc. Os resultados mostram que as tarefas gamificadas promovem comportamentos de índole competitivo entre os estudantes, o que, por sua vez, estimula o pensamento crítico criativo e colaborativo na sala de aula.

## Palavras-chave

*Competências do século XXI; gamificação; consciência cultural crítica; picturebooks*

## Abstract

Some studies related to the implementation of the gamification approach, in both primary and secondary school learning contexts, have started to emerge, focusing on the way the use of this type of approach could foster the development of 21st century skills (Cruz & Orange, 2016). However, little has been seen about the effects of gamified tasks in primary school pupils, especially regarding the role of competitiveness in fostering critical thinking. This paper aims at discussing the implementation of gamified tasks in primary English learning. By following an ethnographic methodological approach, we observed gamified practices with a group of students learning English in the 3rd/4th year, in which they were invited to answer quizzes, develop project work, perform small roleplays, to critically analyse picture-books, etc. The results show that gamified tasks promote competitive behaviour

amongst students, which in - turn, fosters creative and collaborative critical thinking in the classroom.

**Keywords**

*21st Century skills; gamification; critical cultural awareness; picture books*

**Introduction**

In this paper, stories are integrated in a teaching approach as an effort to begin developing a foundation for pupils to think within the classroom walls and to possibly go beyond. We believe that this pedagogical approach is very effective for building critical thinking skills when introduced at early stages of learning. The class sessions we outline here create contexts which assist pupils' abilities to share their thoughts and feelings, to reflect upon them and to make meaningful learning connections. We believe that their successful learning will motivate them and facilitate their development towards critical thinking.

The contextual environment helps to also integrate gamification, storytelling and learning by using different theories present in the literature of Gallo (2016) whereby defining storytelling elements. Mantzicopoulos & Patrick (2011) show how teacher's support and guidance encourage classroom dialogue and facilitate children's cognitive and affective engagement. The anchors of 21st Century Skills learning domain have also been stimulated, namely: collaboration and communication, creativity and innovation, critical thinking and problem solving (Cruz & Orange, 2016).

An experiential communicative approach (Fernández-Corbacho, 2014), taking into account enriched gamification strategies and its elements (Foncubierta & Rodríguez, 2015) are also resorted to in order to achieve educational purposes which can result in significant and easily recalled experiences. Activities are thereby anchored on storytelling with a learning domain implemented by using game elements and participants' activities are related with different multiple intelligences (musical-

rhythmic, visual-spatial, verbal, logical, kinesthetic, interpersonal, intrapersonal, naturalistic or existential) and different type of activities.

## **21st Century Skills into Practice: From Storytelling to Critical Thinking**

In this present-day, interconnected society, communication plays an increasingly important role due to prominent digital and multimedia technology (Cruz, & Orange, 2016). Most certainly, this technology can make the whole process of communication and peer-to-peer collaboration easier, by which pupils are able to critically interpret messages, convey points of view and show their creativity in solving problems (Cruz, 2011). The English language classroom's primary concern is for pupils to communicate across cultures, across borders and across perspectives. As the world evolves towards greater connectedness, it is our pupils to whom we entrust the responsibility of building a better global society. Basic language skills are essential however it is equally indispensable for individuals to have the ability to think out of the box, to be able to find solutions to future problems, to collaborate and to reach a cross cultural consensus.

By considering that pupils may create and express themselves through languages, we are able to concede that language learning forms the basis for professional success in the 21st century. In fact, language education is quite critical to the pupils success in the world of the future, and language arts is regarded as one of the key subjects which pupils have to master, including "English" and other "World languages" (P21, 2015, p. 2). While pupils are learning a language they are developing and learning: a) communication, i.e. the ability to understand, to interpret messages and to present information; b) cultures, because they learn about the cultural views, practices and products of the people who speak the target-language; c) by making connections, i.e., by accessing knowledge from other subjects within the target language; d) by making comparisons, they are able to identify similarities and differences between their own culture and the target

language, while reflecting upon their views of the world, practices and cultural products. (cf. P21, 2010, 2015)

Knowing that stories can serve to teach us about life, about ourselves and about others, storytelling is a unique way for pupils to develop an understanding, respect and appreciation for other cultures, and can promote a positive attitude to people from different lands, races and religions. Stories also enhance intercultural understanding and communication by allowing pupils to experience cultural diversity, by learning how to empathize with unfamiliar people/places/situations, by offering insights into different traditions and values, by showing that wisdom is common to all peoples/culture, by giving newer or different perceptions into universal life experiences and by, very importantly, helping pupils to consider new ideas. (Dujmović, 2006). As Cameron states (2001, p. 159), "stories and themes represent holistic approaches to language teaching and learning that place a high premium on children's involvement with rich, authentic uses of the foreign language".

According to Gallo (2016), for storytelling to connect in a meaningful way it must have three components. These are known as emotional, novel and memorable. Emotion through storytelling is very important because you should try to touch the heart before you reach the brain. It is believed that one can transfer passion through the emotional connection that stories provide. Stories inform, illuminate and inspire through connecting to human beings.

Stories that connect with people in a meaningful way are also novel. They teach something new. Any story that sparks joy, fear, surprise, unexpectedness, that teaches something new and novel is remembered because it is an emotionally-charged event. Storytelling is making an idea novel. It inspires pupils to look at the world in which they live and teaches them something new (Gallo, 2016).

By focusing on and using picturebooks, according to Cleveland (2015), picturebooks can: a) provide relevance and context for meaningful learning; b) develop visual and text literacy, and offer a justification towards the promotion of critical thinking.

Illustrated children's literature is a logical tool for teaching in early elementary education because it is familiar, engaging, and can create multiple meanings with a blend of text and illustration (Wason-Ellam, 2010). Connecting prior knowledge, identifying key concepts, synthesizing information, making inferences, and making predictions are elements of both literacy and scientific practices which are important to develop in elementary years to provide a foundation for future learning (Mantzicopoulos & Patrick, 2011). As stated by Cleveland (2015), by using this kind of literature to engage students in learning, parents can help to build a foundation of knowledge and critical thinking skills for students to build upon as they progress through their life-long learning path.

It is within our belief that storytelling is a teaching approach which can invite pupils to think for themselves and create their own truths. By gathering information through multisensorial sources pupils can formulate their own interpretations and support them with reasons, they are doing what is called critical thinking.

Critical thinking encompasses the use of meta-cognitive processes. Therefore, teachers should help their pupils to develop skills for them to be aware of their perceptions, assumptions and values. By helping pupils to break old habits in terms of negative thinking and to learn how to express their own points of view, pupils are able to position themselves about reality and current issues (cf. Martinez & Niño, 2013).

Team work and collaboration should also be fostered within the classroom walls in order to achieve common goals through didactic tasks, activities and classroom research projects. Pupils should be given the opportunity to position themselves in relation to others by agreeing or disagreeing with their peers. A healthy, active classroom is a sharing classroom where, togetherness builds up bonds, trust and cooperation (cf. McGonical, 2010).

Equally important, creativity should be encouraged to a maximum. Creative thinking involves creating something new or original. It involves the skills of flexibility, originality, fluency, elaboration, brainstorming, modification, imagery, associative

thinking, attribute listing, as well as metaphorical thinking. In this way, we can consider that creative tasks and activities allow pupils to express what they've learnt in a different and newer way.

By acknowledging these strategies, teachers are able to encourage the development of 21st Century skills. It is the sense of pupil's empowerment that needs to be encouraged. They will be given the opportunity to think more critically, to question more readily in light of their quest, as well as to express themselves more creatively, hereafter leading to a strengthening of their communication skills.

Taking this into account, we believe that by endeavoring an experiential communicative approach enriched with (hyper)sensory strategies, teachers are able to engage pupils in understanding and experiencing communication skills by further developing their critical thinking, problem solving, communication and collaboration dexterities within language classrooms. Focus on this approach is given and highlighted in the following chapter.

### **The Gamification Approach: Theories, Assumptions and Elements**

According to AEE (2008), experiential education is "a philosophy and methodology in which educators purposefully engage with learners in direct experience and focused reflection in order to increase knowledge, develop skills and clarify values" (AEE, 2008). Experiential learning delves in introducing a change from an experience or some experiences which are relevant and authentic for pupils and connect them with real life. It is a multidimensional and holistic approach which aims at improving pupil's potential, self-esteem and self-awareness.

In this context, interaction and communication is a focal point, as are pupils' needs and interests. Veritably, the experiential communicative approach encourages pupils to develop interest in exploring and inquiring. Creativity, flexibility, risk taking and leadership characterize this learning approach. By drawing parallels between the communicative approach and the experiential approach, we are able to verify

that the latter seeks pupil's personal growth and development, it enhances their self-esteem, their motivation and respect for diversity whilst simultaneously fostering their risk-taking ability.

Fernández-Corbacho (2014) epitomizes the features of this approach for teachers in the following way: a) classroom tasks need to engage pupils in cooperative strategies, thereby making them responsible for their learning; b) authentic use of language with meaningful and stimulating activities are well-considered; c) each task needs to pose a challenge making it therefore an interest generator; d) focusing on a variety of activities after considering the different learning styles in each group; e) affection and security are of vital importance by offering pupils a sense of assurance and belongingness and ultimately rewarding them for their achievements. Regarding the use of ICT as a classroom tool, Fernández-Corbacho (2014) proposes several activities such as webquests, wikis and blogs with multimedia material, social networks, etc.

Together with the experiential communicative approach, multisensory learning transforms the senses in perception channels that activate the brain connections (Shams & Seitz, 2008). Multisensory learning offers the pupils the opportunity to gain something through experience. We also agree with Arslan (2009) when the author refers that "every lesson should include a hands-on experience". Therefore it is necessary to integrate experiences where pupils have the opportunity of fulfillment, including reflection upon and stimulating critical analysis, in order for pupils to be able to assimilate and create proactive knowledge which may be used in other contexts (Fernández-Corbacho, 2014).

By taking this into consideration, we believe that the gamification pedagogy serves this purpose. According to Kapp (2012), gamification is defined as using game-based mechanics, aesthetics, and game-thinking to engage people, motivate action, promote learning, and solve problems. In fact, it is about applying game elements and game mechanics to non-game activities to make everyday activities more compelling. Game design techniques and game elements such as stories, points, and challenges can motivate learners and change behaviours.

Hereon, game assumptions are taken into the classroom, stimulating the integration of experience, critical analysis and reflection in the teaching-learning process. According to Foncubierta & Rodríguez (2015), the use of gamification can be regarded as the technology which the teacher uses in the learning activity's design (either by analog or digital) introducing game elements (logos, time limit, punctuations, dice, etc.) and thinking (challenges, competition, etc.) in order to enrich the learning experience, directly and/or modify pupils' behaviour in the classroom. Gamification's cynosure lies in influencing pupil's behaviour in a given task, creating and producing experience, offering a domain of feelings within a given content and, at the same time, receiving recognition for their achievement (cf. Hamari & Koivisto, 2013).

Giving particular importance to this type of pedagogy is the so-called "encendido emocional" (Mora, 2013) or affection as previously discussed, i.e., the motivation and the emotional involvement of pupils within a task. It is the emotion that "calls" and stimulates pupils to actively participate in gamified tasks. We can tell when a pupil is engaged in a specific task, if they are cooperative and curious about what follows and dependent on immediate feedback. When the concept of gamification is applied to education, the opportunities for experiential, self-paced and lifelong learning expand exponentially. Learners are engaged in the fun and then rewarded with knowledge and skills (Arnold, 2014). Any tool which can catalyze curiosity from an inert learner will increase potential skill and concept acquisition. (cf. Utendorf, 2013)

### **The Project: Its Design, Methodologies and Results**

In order to accomplish the above-mentioned aims, we will present practices within a M.A. project, which illustrate classroom production and performance by using: a) picturebooks to help provide context for meaningful learning ; b) Web 2.0 applications for collaborative learning; c) creative and (hyper)sensory tasks which help to develop critical reflection;

The chosen methodological approach is qualitative, as it entails class observation of behaviours and reactions. The proposed research questions were: a) can collaborative and cooperative activities help to contribute towards the development of proactive pupils; b) can practices and resources based on the gamification pedagogy foster critical thinking amongst primary school pupils?

These practices took place, within two groups of primary going pupils, consisting of 35 pupils from the area of Oporto, Portugal. These pupils are 3rd and 4th graders at primary school. They have one hour of English lessons, three times per week.

The main topics and focus were "*animals*", "*friends*", "*emotions*" and "*parts of the house*". The picturebook "*Home*" by Smith (2011) was used as the main resource. Gamified tasks based on the digital platforms, *Kahoot* and *Plickers* comprehension questionnaires were used. Problem problem-solving activities were implemented with the introduction of *story maps*. Other diverse types of tasks, in order to introduce collaborative and creative means, were also included.

The study included a pre-questionnaire with the aim to describe the project's learner types and to assess their preferable learning styles. We would also like to refer that the data collection tools included also the following: a) field notes; b) questionnaires; c) projects/worksheets; d) audios/videos.

Results of the pre-questionnaire concluded the following: a) 22% of the pupils preferred working alone, whereas 78% preferred working with colleagues; b) 86% of the pupils have already played board games, whereas 14% have played *Kahoot*; c) 89% enjoyed storytelling, while 11% preferred reading on their own; d) 100% of the pupils favoured solving tasks with bodies/computers, opposed to 0% of the pupils who disliked solving worksheets individually.

In the first session, as part of a pre-reading activity, the teacher started the warm up by activating and pre-teaching vocabulary. The main focus of this activity was to familiarise pupils with the characters of the story, the "*animals*", in order to introduce the "*parts of the house*", and to focus on "*emotions*". Flashcards were shown to pupils and were accompanied by gestures. Mime and gestures stimulate

the body senses and help to facilitate communication, understanding, participation, as well as to make the vocabulary more memorable.

Having acquired newly learnt vocabulary and actively participated in kinaesthetic activities, the teacher presented the picturebook to pupils. The story was an interactive reading where the teacher, in order to sustain the story, used a variety of didactic strategies. A data projector was used for a class to listen to/read the story as a whole-class activity (picture 1).



Picture 1. Interactive reading of "Home" picturebook

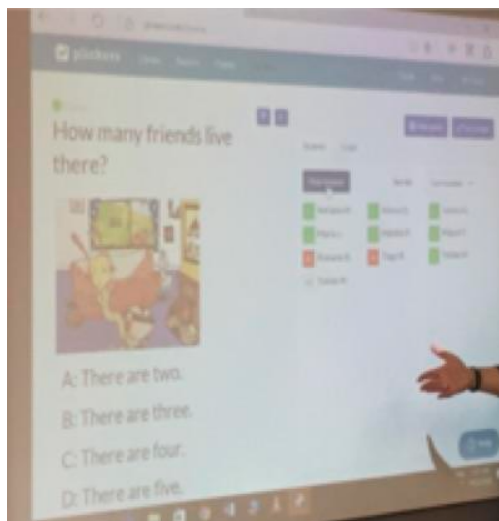
To help ensure total physical response, pupil's involvement, the development of listening skills and assessment of the pupils, they were asked to mime and gesture when they identified and heard the pre-taught vocabulary (picture 2). In order to help develop motivation, participation and understanding the teacher asked convenient 'cliff-hanger' points and questions. This use of prediction skills helped to contribute towards pupil's engagement. The deliberate concept check type questions asked included: a) recollecting knowledge and fact by focusing on questions, such as "who?", "why?", "when?", "how?", "where?", etc.; b) scaffolding of pupils' responses by for example, using the illustrations in the text to organize the questions asked and expecting one/two word answers; c) understanding and interpretation of facts, namely "what colour is it, how do we know, how do they feel?; d) asking for solutions to problems by applying knowledge and facts, such as "what are they going to do next, what would you say/do?"; e) identifying motives and

causes, namely “where did they go, why did they go there?”; f) synthesizing and creating a new idea/solution such as, “think of another character for the story, what would you say/do?” g) assessing by letting pupils present ideas, give opinions and make judgements. (cf. Ellison, 2010)



Picture 2. Pupils using gestures during storytelling

To evaluate pupil’s understanding and comprehension, two digital platforms were used in the classroom. The younger group used “*Plickers*”. It is a simple tool that helps teacher’s collect real-time formative assessment data without the need for technological devices (picture 3). It checks for understanding of knowledge through multiple choice questions and gives all pupils the chance to participate and engage in learning.



Picture 3. Comprehension Exercises on Plickers

The second group used the “Kahoot” digital platform. Kahoot incorporates the gamification model in a clear way. It is typically used for formative assessment, to monitor pupils’ progress towards learning objectives. It aids in identifying strengths and weaknesses (picture 4). It offers more challenging learning opportunities and helps to give a review of foundational knowledge a subject. (cf. Valle, 2015)



Picture 4. Comprehension Exercises on Kahoot!

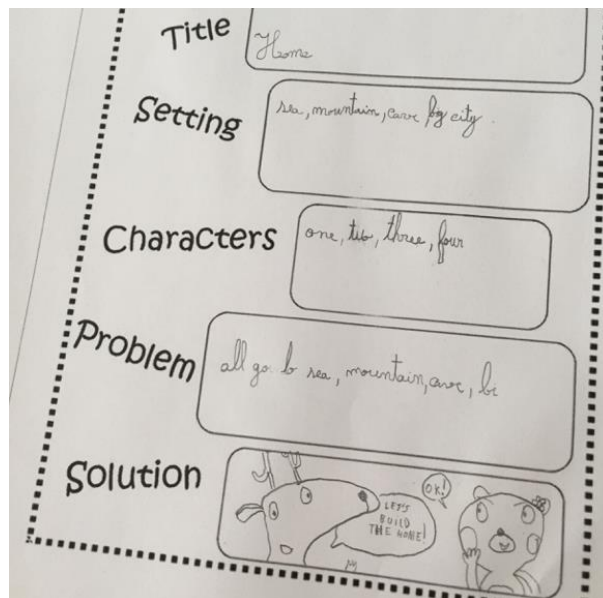
In the second session, there was a retelling of the story and reactivation of the vocabulary. Story retelling helps to ensure that pupils have properly understood the storyline. Pupils are able to focus on the setting, the main characters, on the plot of the story and prepare themselves for problem solving.

Pupils were then introduced to a “story map”. A story map is a strategy which helps pupils to organize and to help learn the elements of the story. Focus is given to the identification of the characters, the setting, the problem and ultimately, the solution. Offering a series of advantages, story maps; a) help improve comprehension; b) provide a framework for identifying the story elements; c) help to organize information and ideas efficiently (cf. Adlit.org, 2008). In picture 5 we can see an example of one of the story map worksheets the pupils had to fill in.

Focus was then given to problem solving and critical reflective activities. We believe that these skills can be fostered by using authentic material which may pose and induce pupils into questioning and solving problem-situations. The teacher gave the

pupils the chance to choose the activity that they could better identify themselves with, allowing for pupil's sense of empowerment.

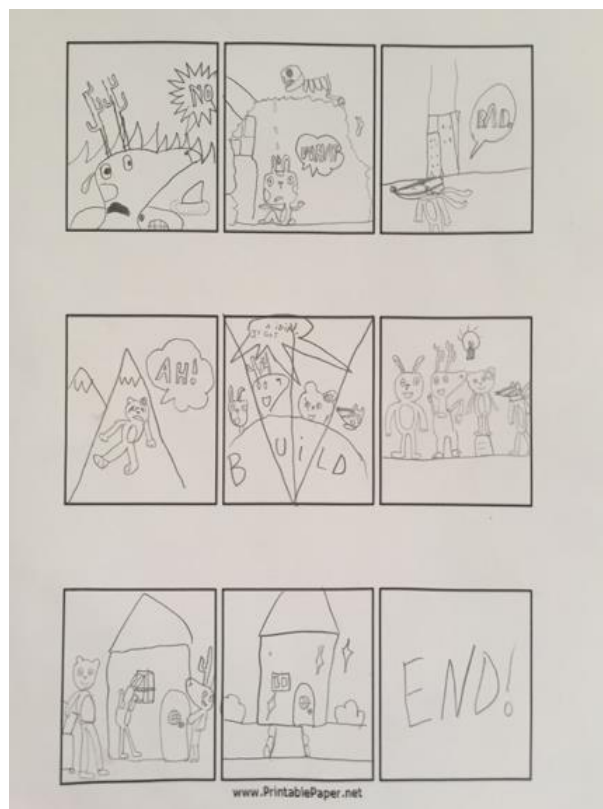
The following activities were presented and may be considered as critical thinking tasks. Due importance was also given to collaborative and creative activities alongside skills development. These diverse tasks included: a) comic strip productions (picture 6); b) pupils own drawings; c) acrostic poem; d) inventing a yodel song; e) making of finger puppets and dialogue invention; f) making a word cloud.



Picture 5. An example of a story map worksheet developed by one of the pupils

All these activities were completed collaboratively in pairs and/or in small groups. By making provision for social-learning environments, allows pupils to see other points of view. A major value of collaboration in learning is the following: "we can do more and better work collaboratively than we can alone" (Johnston-Parsons, 2010, p. 289). "The knowledge, attitudes, and skills associated with and learned through collaborative learning best prepare students to work and live in an increasingly diverse and interconnected world" (Lavorata, 2013, p. 1).

Not only collaborative learning develops social skills and fosters an inclusive classroom, it also possesses other benefits. According to Lavorata (2013), they can be categorized as social and psychological benefits. Social benefits include: a) encouraging and building diversity; b) embracing a shared knowledge between pupils and teachers; c) inviting pupils to share experiences and view situations from others' perspectives. The psychological benefits include: a) building of self-esteem; b) reducing pupils' anxiety; c) having an overall positive attitude towards peers and teachers. It is therefore to our belief that collaborative learning engages and empowers pupils by actively involving them in the learning process.



Picture 6. An example of a comic strip project

Our sessions were finalized with a self-assessment questionnaire (picture 7), where pupils answered by: a) using the thumbs up/thumbs down strategy; b) giving examples of what they have learned; c) writing a short composition giving the solution to the story's problem.

2. Tick how you feel about having accomplished the lessons aims and give examples of what you have learned.

	I am able to...		Give an example...
	express feelings	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Tell how you feel now. _____ _____
	tell the names of the animals in the story	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Give two examples. _____ _____
	tell the names of some parts of the house	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Write four items you may find in a house. _____ _____ _____ _____
	talk about the animals' wishes	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Give two examples of the wishes they had. _____ _____

3. Explain how the animals could solve their problem. Summarize the main ideas. You may use Portuguese.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Picture 7. Self-assessment Questionnaire

## Conclusions

It is within our understanding that educating in the 21st Century is the considering of an interconnected society where communication continues to play a predominant role.

Within our project the following findings have been observed: a) interactive and gamified storytelling allows for a better comprehension of the story and its elements; b) reflection throughout the whole process (pre-reading/reading/post-reading) plays an important role in the learning process; c) pupils prefer activities which involve collaboration, body activity, senses, the use of computers/tablets/mobile phones; d) gamified activities may work as a springboard for the development of pupils' critical thinking skills; e) creativity can be stimulated if you give pupils options and samples which may guide them in finding their own ways; f) pupils love having different options which suits best their learning styles; g) not all

pupils are able to develop creativity and collaborative skills at the same rhythm as others; h) mother tongue plays an important role in the reflective activities.

## References

- Adlit.org. (2008). Story Maps. Retrieved from <http://www.adlit.org/strategies/22736/>.
- AEL- Association for Experiential Learning (2016). What is experiential learning? Retrieved from <http://www.aee.org/what-is-ee>.
- Arnold, B. (2014). Gamification in Education. Proceedings of ASBBS, Las Vegas, Vol. 21 (1), 33-39.
- Arslan, K. (2009). Multisensory learning and the future of learning. Ezine Articles. [On-line]. Available:<http://ezinearticles.com/?Multisensory-Learning-and-the-Future-of-Teaching&id=4077370>.
- Cameron, L. (2001). Teaching Languages to Young Learners. Cambridge: Cambridge University Press.
- Cleveland, E. (2015). Using Children's Picturebooks to Develop Critical Thinking Skills and Science Practices in Grades 3rd-5th (Doctoral Projects, University of Wyoming). Retrieved from [http://repository.uwyo.edu/plan\\_b/11](http://repository.uwyo.edu/plan_b/11).
- Cruz, M. (2011). Consciência cultural crítica numa comunidade virtual educativa de línguas (PhD Thesis, Universidade de Aveiro). Retrieved from <http://ria.ua.pt/handle/10773/8201>.
- Cruz, M.; Orange, E. (2016). 21st Century Skills in the Teaching of Foreign Languages at Primary and Secondary Schools. TOJET: The Turkish Online Journal of Educational Technology, Special, 1 - 12.
- Dujmovic, M. (2006). Storytelling as a Method of EFL Teaching. Methodological Horizons, 1(1), 75-88.
- Gallo, C. (2016). The Storyteller's Secret: From TED Speakers to Business Legends, Why Some Ideas Catch on and Others Don't. New York: St. Martin's Press.
- Ellison, M. (2010). Make them think! Using literature in the primary English language classroom to develop critical thinking skills. Porto: Faculdade de Letras Universidade do Porto
- Fernández-Corbacho, A. (2014). Aprender una segunda lengua desde un enfoque comunicativo experiencial. Programa de Desarrollo Profesional. Madrid: Editorial Edinumen.
- Foncubierta, J., & Rodríguez, C. (2015). Didáctica de la gamificación en la clase de español. Programa de Desarrollo Profesional. Madrid: Editorial Edinumen.

- Hamari, J., & Koivisto, J. (2013). Social motivations to use gamification: an empirical study of gamifying exercise. 21st European Conference on Information Systems Proceedings. Utrecht, Holanda.
- Johnston-Parsons, M. (2010). Dreaming of Collaboration. *Language Arts*, 87(4), pp 287-295.
- Kapp, K. (2012). *The Gamification of Learning and Instruction: Game-Based Methods and Strategies for Training and Education*. San Fransisco, CA : John Wiley & Sons.
- Lavorata, B. (2013). A Critical Reflection of Collaborative Inquiry: to what extent is collaborative learning beneficial in my classroom? *SFU Education Review*, 1(1), 1-13.
- Mantzicopoulos, P., & Patrick, H. (2011). Reading picture books and learning science: Engaging young children with informational text. *Theory Into Practice*, 50(4), 269-276.
- Martinez, A., & Niño, P. (2013). Implementing tasks that stimulate critical thinking in EFL classrooms. *Cuadernos de Lingüística Hispánica*, 21, 143-158.
- McGonigal, J. (2010) Gaming can make a better world. Retrieved from [https://www.ted.com/talks/jane\\_mcgonigal\\_gaming\\_can\\_make\\_a\\_better\\_world](https://www.ted.com/talks/jane_mcgonigal_gaming_can_make_a_better_world).
- Mora, C. (2013). Gamificación: lo congitivo, lo emocional y lo social. Retrieved from <https://entrementeycuerpo.wordpress.com/2015/03/20/gamificacion-lo-congitivo-lo-emocional-y-lo-social>.
- P21 - The Partnership for 21st Century Learning. (2010). 21st Century Skills Map Retrieved from [http://www.p21.org/storage/documents/P21\\_arts\\_map\\_final.pdf](http://www.p21.org/storage/documents/P21_arts_map_final.pdf).
- P21 - The Partnership for 21st Century Learning. (2015). P21 Framework Definitions. Retrieved from [http://www.p21.org/storage/documents/docs/P21\\_Framework\\_Definitions\\_New\\_Logo\\_2015.pdf](http://www.p21.org/storage/documents/docs/P21_Framework_Definitions_New_Logo_2015.pdf).
- Shams, L., & Seitz, A. (2008). Benefits of multisensory learning. *TICs*, 721. Retrieved November 19th, 2015, from [http://faculty.ucr.edu/~aseitz/pubs/Shams\\_Seitz08.pdf](http://faculty.ucr.edu/~aseitz/pubs/Shams_Seitz08.pdf).
- Smith, A. (2011). *Home*. London: Scholastic.
- Valle, R. (2015). Getting Your Students' Head in the Game with Kahoot. Retrieved from <http://edtechreview.in/trends-insights/insights/1844-getting-your-students-head-in-the-game-with-kahoot>.
- Utendorf, H. (2013). What Does "Gamification" Mean? *Intrepid Learning*, 30 Aug. 2013.
- Wason-Ellam, L. (2010). Children's literature as a springboard to place-based embodied learning. *Environmental Education Research*, 16(3-4), 279-294.





1999-2017

# Challenges 2017

Aprender nas nuvens, Learning in the clouds

ISBN: 978-989-97374-5-7

Universidade do Minho. Centro de Competência