

IDENTIFICAÇÃO DO PROJETO

Referência do projeto: PTDC/ART-OUT/3560/2021

Designação: Desenhar entre Fronteiras na Universidade

Aprendizagem, Investigação e Comunicação pelo Desenho na Universidade.

Investigador Responsável: Mário Augusto Bismarck Paupério de Almeida

Instituição Proponente: i2ADS - FBAUP

Entidades parceiras: CMUP; i3S

Data de início: 15-10-2021 **Data de fim :** 14-04-2025

Financiamento concedido: € 232.473,86

PROJECT IDENTIFICATION

Project reference: PTDC/ART-OUT/3560/2021

Name: Drawing Across University Borders

Learning, Researching and Communicating through Drawing in the University.

Principal Investigator: Mário Augusto Bismarck Paupério de Almeida

Proponent Institution: i2ADS - FBAUP

Partner entities: CMUP; i3S

Starting date: 10-15-2021 **Ending date:** 14-04-2025

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ÍNDICE

1. SUMÁRIO	4
2. TRABALHOS DESENVOLVIDOS	6
2.1. Resumo dos trabalhos	6
2.2. Desvios dos trabalhos face à proposta aprovada	8
2.3. Equipa de Investigação	10
2.4. Orçamento	13
3. QUADRO DE INDICADORES	14
4. RESULTADOS	
4.1. Publicações	15
Livros	15
Artigos / Capítulos de livro internacionais	17
Artigos / Capítulos de livro nacionais	18
4.2. Comunicações	20
Encontros Científicos Internacionais	20
Encontros Científicos Nacionais	23
4.3. Organização de seminários e conferências	25
4.4. Workshops	31
4.5. Formação avançada	40
Teses de Doutoramento	40
4.6. Outras ações públicas de disseminação	41
Workshops públicos	41
Exposições	42
5. ANEXOS	44
Atualização do plano de trabalho	44
Atualização do cronograma	45

1. SUMÁRIO

The project aims to undertake a longitudinal study on the relationship of students and researchers with drawing within the University to develop new learning strategies and research skills based on drawing activities in Higher Education. DRAWinU is focused on the learning impact, the promotion of creative thinking, visual-spatial reasoning, project methodology and the dissemination of knowledge through drawing. The frame for this study is the research units and classrooms of the Faculties of the University of Porto (UP). UP provides a learning and research context where drawing can be addressed in a common framework in which Science, Technology, Engineering, Mathematics (STEM) and Art coexist: by confronting its differences, we can also find its common ground.

It is generally accepted that drawing practice creates shared circuits between active perception, cognition and creativity, thus, playing a constitutive role in the production of knowledge. In recent years, there has been an increasing proliferation of drawing-based research developing new approaches to integrate drawing within the curriculum of University training, as a means of enhancing general literacy, assisting decision-making processes and promoting observational strategies through notation, within STEM areas (1) (2) (3). This trend accompanies a growing awareness of the impact of drawing and art practices in the educational turn of STEM areas (4) (5) (6), complementing the knowledge acquired by other visual, numeric or textual means.

However, there is no longitudinal study on the impact of drawing in the context of the Portuguese University that addresses the various perspectives underlying the use of drawing by artists, researchers and students outside the creative areas to which it is usually associated. This lack of research has resulted in uncertainty regarding the approaches that may be most effective in the development of drawing-based methods applied to research and training.

The group is composed of artists, researchers and professors in drawing fields. Their common goal is the development of drawing-based strategies for research in art and science, seeking to overcome the barriers that define the two cultures within the University. It is supported by a network of consultants in the key areas of study.

The project is organized in three main interrelated parts:

The first part is the surveying and documentation of drawing activities used in learning and research at the University. It is based on observation in classrooms and research units, and in the recording of interviews, resulting in a selection of data in collaboration with the actors of STEM areas. This survey is closely linked to the perception with which informants consider their drawing experience in relation to the content of knowledge.

The key areas are the Faculty of Sports (FADEUP), the Departments of Mechanics and Civil Engineering (FEUP), Natural Sciences and Mathematics (FCUP), the areas of Microbiology and Biochemistry (ICBAS), Archaeology, Cartography and Geography (FLUP) and Health Sciences (I3S).

The second part is focused on practice-based research carried out by artists-researchers within the project. Its purpose is to confront the conjectural space of art and science through drawing and address the speculative means of these ways of knowing in an experiential way. Two purposes drive this component:

- Creation of Collective Drawing Labs based on the visual-spatial and causal content of STEM areas, to develop new reflexive approaches to address learning outcomes through drawing activities;
- Development of drawing research activities between Art and STEM. Whether using scientific methods or the epistemology of science, or because the researched phenomena are not restricted to a specific scientific discipline (7), drawing between Art and STEM (STEAM) can generate new modes of research to further art practices that offers new methods back to STEM processes'(1).

The third part aims to understand the reasoning and communicative processes underlying drawing's approach to visual-spatial and causal content in STEM areas in UP. Using a backward design approach, we will analyze how drawing conveys complex knowledge and generate an active engagement with scientific content.

This approach is framed by practice-based research, visual participatory methodology, psychology of perception (8) and gestural studies. As a participatory visual methodology, drawing encourages a collaborative meaning-making where the drawers' context is re-

2. TRABALHOS DESENVOLVIDOS

2.1. Resumo dos trabalhos

Este relatório cobre o período de 01 janeiro a 14 de outubro de 2023 do projeto DRAWinU (<https://doi.org/10.54499/PTDC/ART-OUT/3560/2021>).

Este enquadramento temporal (10 meses ao invés de 12 meses) justifica-se pela continuidade do período descrito no primeiro relatório de progresso. Atendendo às datas em que foi permitido o início da despesa com as atividades de projeto, o primeiro relatório cobriu 12 meses a contar de janeiro de 2021. Com este segundo relatório, retoma-se o período regulamentado, tendo em conta a data de início do projeto (15 de outubro de 2021).

Os dados inseridos na plataforma FCT SIG são complementados por este relatório ilustrado submetido em anexo.

Durante este período, a equipa cumpriu e ultrapassou as metas propostas, de acordo com os indicadores que a seguir se identificam. O segundo ano do DRAWinU assentou em dois grupos de tarefas em execução, cujos objetivos e resultados se descrevem à continuação.

WP3 – *DRAWING BASED RESEARCH DEVELOPMENT* inclui as seguintes tarefas:
TAREFA 11 - *Drawing Collaborative Labs in STEM areas*.

OBJETIVOS E RESULTADOS: a tarefa 11 consistiu na colaboração com atores STEM (professores, investigadores e estudantes) da Universidade do Porto no desenvolvimento de workshops colaborativos de ensino/aprendizagem através do desenho. Estes workshops de desenho são fundamentais para o processo de validação de atividades de desenho em ambientes STEM. A equipa desenvolveu uma abordagem baseada num design retroativo dentro de um quadro de investigação-ação de modo a identificar resultados específicos de aprendizagem e conceber atividades de desenho capazes de envolver os participantes nos processos que melhor correspondam ao modo de pensamento epistémico de cada área científica.

Estando prevista a realização de 3 workshops colaborativos, a equipa desenvolveu e implementou 5 ações, a que se soma o workshop antecipado em 2022 e descrito no respetivo relatório de progresso. Estes workshops são detalhados no ponto 4.4 do relatório ilustrado em anexo:

#1 *Drawing metabolic maps: simplifying complexity* (Instituto de Ciências Biomédicas U.Porto).

#2 *Tactile drawing: manipulating to learn about and represent human osteology* (Faculdade de Medicina U.Porto).

#3 *The Visualisation of Interoception: Drawing the feelings and sensations that we have inside us* (I3S – Instituto de Investigação e Inovação em Saúde, U.Porto).

#41 *Brains out: drawing through augmented reality models* (Faculdade de Medicina, U.Porto).

#5 *Mapping territories: Drawing and the representation of space* (Faculdade de Engenharia, U.Porto).

Como resultados diretos dos workshops, destacam-se três comunicações internacionais, detalhadas no ponto 4.2 do relatório ilustrado em anexo: #2 *European Conference on Educational Research 2023 – The Value of Diversity*; #3 *10th International Conference on Illustration and Animation*; #4 *Fault Lines - InSEA World Congress 2023*.

Destaca-se ainda uma submissão de artigo a revista internacional (DRTP – *Drawing Research, Theory and Practice*), cuja publicação foi aceite e encontra-se em revisão. Realça-se que o resultado destes workshops será objeto da segunda *milestone* do projeto - *Drawing Collaborative Labs Pedagogical Book* - que se encontra em fase de conceção. A publicação está prevista para Abril de 2024, de acordo com a revisão do cronograma aprovada pela FCT em Novembro de 2023.

Os relatórios destes workshops estão em fase de publicação no *Research Catalogue* – uma base de dados de investigação artística com revisão por pares – a partir do portal do i2ADS. Dois dos relatórios, ainda em progresso, podem ser acedidos no seguinte apontador: <https://www.researchcatalogue.net/project/show?project=1706754>

TAREFA 12 - *Drawing Research Practice between Art and STEM*.

OBJETIVOS E RESULTADOS: Esta tarefa é realizada por artistas-investigadores da equipa. Tendo como quadro metodológico a investigação artística, o seu objetivo é possibilitar uma troca criativa entre o desenho como prática artística e o conteúdo científico das áreas-foco STEM. A tarefa inclui as seguintes atividades: revisão da literatura; investigação baseada na prática artística e documentação do processo criativo, a publicar no *Research Catalogue*. Tratando-se de uma tarefa em curso até ao mês 30 do projeto (ver «cronograma» no ponto 5 do relatório ilustrado), as publicações no RC ficarão disponíveis durante 2024.

Ainda decorrente da tarefa 12, realça-se a publicação de artigo internacional / capítulo de livro, em publicação editada pela *Universidad de Zaragoza* (ver #1 do ponto 4.1 do relatório ilustrado em anexo). Foi ainda apresentada uma comunicação internacional na *European Conference on Educational Research 2023*, descrita em #1 da secção “Comunicações Internacionais” do ponto 4.2 do relatório ilustrado).

Por último, concluiu-se a segunda Tese de Doutoramento associada ao projeto (ponto 4.5 do relatório ilustrado), com a respetiva defesa. A tese, decorrente do cruzamento entre as ciências do território, a análise do movimento humano e a investigação artística, esteve ainda na origem de duas exposições do projeto (ponto 4.6 do relatório ilustrado).

(2) WP4 – DISSEMINAÇÃO E PROMOÇÃO DE CONHECIMENTO é composto pelas seguintes tarefas:

TAREFA 14 - Dissemination in Portuguese STEM and Art Research community.

OBJETIVOS E RESULTADOS: A tarefa 14 tem a seu cargo a disseminação do projeto na comunidade nacional de investigação em Arte e STEM. O objetivo é criar uma rede de investigação sobre desenho que interligue as diferentes áreas da Universidade.

SIMPÓSIOS: A equipa organizou dois seminários. O seminário “Depois do Desenho” decorreu da exposição “Desenhar entre Fronteiras”, apresentada no Museu Nacional Soares dos Reis (estava inicialmente previsto para 2022). O seminário contou com keynotes da equipa DRAWinU, debates com os consultores internos do projeto, estudantes convidados e policymakers da Universidade, em torno de duas questões fundamentais: Com que desenhos aprendemos e ensinamos na Universidade? Que futuro para o desenho nas áreas STEM? (ver #1 do ponto 4.6 do relatório ilustrado em anexo). A equipa organizou outro seminário dedicado ao desenho nas ciências do território: “Representações, Imagens e Desenhos do Território” (ver #2 do ponto 4.6 do relatório ilustrado). No total, ambos eventos reuniram perto de 260 participantes.

A equipa foi responsável por 12 comunicações em encontros científicos nacionais (ver ponto 4.6 do relatório).

PUBLICAÇÕES: Concluiu-se a publicação do livro *Drawing Across University Borders*, decorrente da WP2 (tarefas 2 a 10), concluindo-se deste modo a *milestone* 1. Foi ainda publicado um capítulo em livro de âmbito nacional (ver ponto 4.1 do relatório ilustrado em anexo)

EXPOSIÇÕES: Foi apresentada a exposição SEM ESPAÇO no Museu da Faculdade de Belas Artes U.Porto, decorrente da investigação doutoral no âmbito do projeto, descrita no ponto 4.6 do relatório ilustrado em anexo.

TAREFA 15 - *Development of DRAWinU international Network.*

OBJETIVOS E RESULTADOS: A tarefa 15 é responsável pelo desenvolvimento da rede internacional de desenho entre disciplinas na educação superior e disseminação dos resultados em fóruns internacionais.

SIMPÓSIOS: No período abrangido, a equipa contribuiu com 4 comunicações em conferências internacionais nas áreas da investigação em educação (ECER 2023 & INSEA 2023) e da investigação em desenho (CONFIA 2023), ultrapassando as metas estabelecidas para o conjunto de comunicações internacionais e nacionais (ver ponto 4.2 do relatório ilustrado em anexo).

PUBLICAÇÕES: Decorrentes das atividades realizadas em WP2 e WP3, foram ainda publicados 3 capítulos de livro em publicações internacionais, com submissão e revisão por pares. Destaca-se o capítulo incluído em *Integrated Project Design. Digital Innovations in Architecture, Engineering*, publicado pela editora Springer, Cham (ver ponto 4.1. do relatório ilustrado em anexo).

2.2. Desvio dos trabalhos face à proposta aprovada

Atualização do cronograma

Ao abrigo do artigo 6, ponto 1, alínea h do «Regulamento de projetos financiados exclusivamente por fundos nacionais» da Fundação para a Ciência e Tecnologia (FCT), foi solicitada a prorrogação do prazo de conclusão do projeto DRAWinU por um período de 6 meses. O pedido, deferido pela FCT em novembro de 2023, foi motivado pela licença de maternidade da investigadora contratada Marina Vale Guedes, no total período de 150 dias, com efeito entre os dias 26 de setembro de 2023 e 23 de fevereiro de 2024, e justificado pelo impacto da licença na conclusão das quatro tarefas em que estava envolvida (11, 12, 14 e 15).

O plano de investigação mantém-se nas linhas gerais submetidas, sofrendo apenas alterações nos prazos previstos para os *resultados* das atividades e *milestones* dos *WP*.

A prorrogação permitirá à investigadora Marina Vale Guedes reintegrar-se no projeto, assegurando a continuidade da sua investigação e a colaboração com a equipa na conclusão das tarefas em que está envolvida. A equipa está comprometida em minimizar quaisquer impactos adversos decorrentes desta alteração do cronograma e assegurar uma cabal concretização de todos os resultados previstos.

Este compromisso é já visível na forma como as metas propostas para a tarefa 11 foram superadas

(ponto 4.4 do relatório ilustrado). O cronograma atualizado foi oportunamente enviado à FCT. Anexa-se o documento, juntamente com o esquema de trabalho, que inclui as alterações assinaladas a verde (ponto 5 do relatório ilustrado).

Destaca-se ainda o interesse gerado pelos workshops colaborativos de desenho nas diversas áreas STEM da Universidade onde a equipa tem atuado. Neste sentido, foi decidido continuar a tarefa até março de 2024, incluindo os novos workshops colaborativos na *milestone 2 – Drawing Labs Pedagogical Book—Sketching STEM*. Esta *milestone*, inicialmente prevista para outubro de 2023, foi atualizada no novo cronograma para abril de 2024, incluindo-se deste modo as colaborações da investigadora Marina Vale Guedes e os novos workshops em preparação. No momento de encerramento do relatório, a *milestone* está em fase de conceção, encontrando-se a equipa a elaborar os enunciados, materiais e capítulos que integrarão o *toolkit*.

Sinaliza-se a conclusão da *milestone 1* (inicialmente prevista para o fim de 2022) (#1 do ponto 4.1 do relatório ilustrado) e a organização do Seminário sobre Desenho e STEM (*deliverable 12*), inicialmente previsto para novembro de 2022 (#1 do ponto 4.3. do relatório ilustrado). Destaca-se ainda que a equipa cumpriu, neste momento, as metas previstas para a organização de seminários e conferências, comprometendo-se a ampliar o proposto com um seminário e conferência internacional em 2024.

Recursos humanos:

Após a conclusão da Bolsa de Iniciação à Investigação (BII) o DRAWinU propôs-se reforçar a equipa com a contratação de uma estagiária de investigação, com aviso lançado a 16 de março de 2023 e avaliação concluída em 24 de abril de 2024. Este reforço, previsto no primeiro relatório de progresso, fundamentou-se no volume de dados recolhidos em WP2 e na necessidade de manter o repositório atualizado. A estagiária de investigação colabora nas tarefas 1, 10, 11, 12, 13, 14 e 15. As suas funções incluem ainda trabalho de investigação no herbário da Universidade do Porto, no âmbito do WP2, com a coordenação da Doutora Cristiana Vieira (Faculdade de Ciências da U.Porto) e do Professor Paulo Luís Almeida (DRAWinU). Este reforço na tarefa 12 permitiu ao projeto ampliar as suas áreas de estudo, incluindo o património dos desenhos de botânica da U.Porto no projeto.

Missões.

Sinalizamos ainda a impossibilidade de realizar a missão prevista de reunião com as consultoras externas do projeto por dificuldades de conciliar agendas e pelo estado de saúde agravada da Professora Deanna Petherbridge. Este desvio foi ultrapassado por reuniões virtuais para exposição e aconselhamento quanto às atividades do projeto, nomeadamente na preparação e implementação dos workshops colaborativos.

Publicações

Sinaliza-se a orientação dos artigos dos investigadores e investigadoras para publicações internacionais. Esta orientação reflete o investimento feito na internacionalização do projeto, não interferindo com o número total de artigos proposto.

2.3. Equipa



Mário Bismarck (Investigador Responsável), i2ADS, FBAUP
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Tarefas WP1. Project Management /WP2. Drawing Activities in Microbiology and Biochemistry / WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. DRAWinU Website /WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP1. Project Management /WP2. Drawing Activities in Sports / WP3. Drawing Research Practice Between Art and STEM / WP4. DRAWinU Website /WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities in Natural Sciences / WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities in Mathematics / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities in Microbiology Natural Sciences / WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities (...) / WP2. Scientific and Technical Management of Data / WP3. Drawing Collaborative Labs / WP 3. Drawing Research Practice Between Art and STEM / WP4. DRAWinU Website



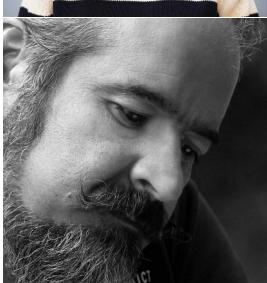
Maria Manuela Lopes (Investigadora), i3S-UP; IPP
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Tarefas WP2. Drawing Activities in Neurosciences / WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



Marina Vale Guedes (Investigadora), i2ADS, FBAUP

Tarefas WP2. Drawing Activities in Medicine / WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities in Mathematics / WP2. Drawing Activities in Territory Research / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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Tarefas WP2. Drawing Activities in Architecture / WP3. Drawing Research Practice Between Art and STEM / WP4. DRAWinU website / WP4. Dissemination in Portuguese STEM and Art Research Community / WP4. DRAWinU International Network.

Colaborações (desde 2023)



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WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.



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WP3. Drawing Collaborative Labs in STEM areas / WP3. Drawing Research Practice Between Art and STEM / WP4. Dissemination in Portuguese STEM and Art Research Community /WP4. DRAWinU International Network.

Conselho Científico Externo

Deanna Petherbridge CBE

Professor Emeritus, University of the West of England, Bristol.
Associate Fellow, the Warburg Institute, University of London.
Inaugural Research Fellow, The Menil Drawing Institute, The
Menil Collection, Houston.

Gemma Anderson

Co-I / Research Fellow (AHRC), Egenis Centre and Living Systems Institute, University of Exeter
Artist in Residence, Department of Mathematics, Imperial College London
Associate Lecturer in Drawing, Falmouth University
Drawing Research Associate, The Big Draw, UK

Consultoria Científica Interna

João Carlos Garcia (FLUP);
João Horta Belo (FCUP; IFIMUP)

José Almacinha (FEUP);
José Alberto Gonçalves (FCUP);

Luis Belchior Santos (ICBAS)

Luís Viegas (FAUP);

Maria de Jesus Sanches (FLUP);

Maria Strecht Almeida (ICBAS);

Mário Barroca (FLUP);

Mário Gonçalves Fernandes (FLUP);

Rubim Almeida (FCUP);

Rui Cardoso (FAUP);

Teresa Lacerda (FADEUP);

Vitor Manuel Oliveira (CITTA, FEUP).

2.4. Orçamento

A estratégia financeira manteve-se ao longo do segundo ano, focada sobretudo nas vertentes de Recursos Humanos, Aquisição de Bens e Serviços, Demonstração Promoção Divulgação (DPD), conforme previsto.

O orçamento do DRAWinU teve como uma das suas apostas a contratação de recursos humanos, nomeadamente a contratação de investigadora júnior e abertura de posição para estagiária de investigação, para apoio a WP2, apoio às estratégias de promoção e divulgação e ampliação das áreas foco do projeto. Sinaliza-se que orçamento que enquadrou a abertura deste concurso proveio de verbas não gastos com recursos humanos, decorrentes do atraso da contratação em 2022 da investigadora júnior, devido aos prazos dos procedimentos concursais e contratuais, só possíveis após a assinatura do contrato do projeto com a FCT, e identificados no primeiro relatório de progresso.

Os desvios que se verificaram na execução financeira dizem respeito a uma sub-execução das rúbricas de Missões e Aquisição de Bens e Serviços.

Regista-se, em sentido inverso, uma sobre-execução das rubricas Demonstração, Promoção e Divulgação (DPD).

Missões

A sub-execução nesta rúbrica refere-se à incompatibilidade de agenda para reunião com as consultoras externas do projeto. As verbais serão reprogramadas para consolidar as missões em 2024.

Aquisição de Bens e Serviços:

Neste campo, o orçamento esteve sobretudo vocacionado para a organização dos workshops colaborativos (tarefa 11) e organização dos seminários (tarefa 14). A sub-execução está relacionada com o atraso na entrega das entrevistas iniciadas em 2022 em formato editado. Reforçamos que o atraso é financeiro e não científico, uma vez que as entrevistas foram realizadas. Sinaliza-se ainda que não foram adquiridos materiais de apoio à investigação em desenho entre arte e STEM relacionados com a tarefa 15. Embora a tarefa tenha sido já iniciada, a necessidade de aquisição será sentida no orçamento de 2024.

Demonstração, Promoção e Divulgação:

Os desvios referem-se ao aumento dos custos, transversais a diversos sectores em 2023, que se refletiram nas seguintes atividades: aumento com os custos de impressão relativos à publicação do livro de investigação, tradução e revisão editorial; aumento dos custos de viagens associados à participação em conferências internacionais.

3. QUADRO DE INDICADORES

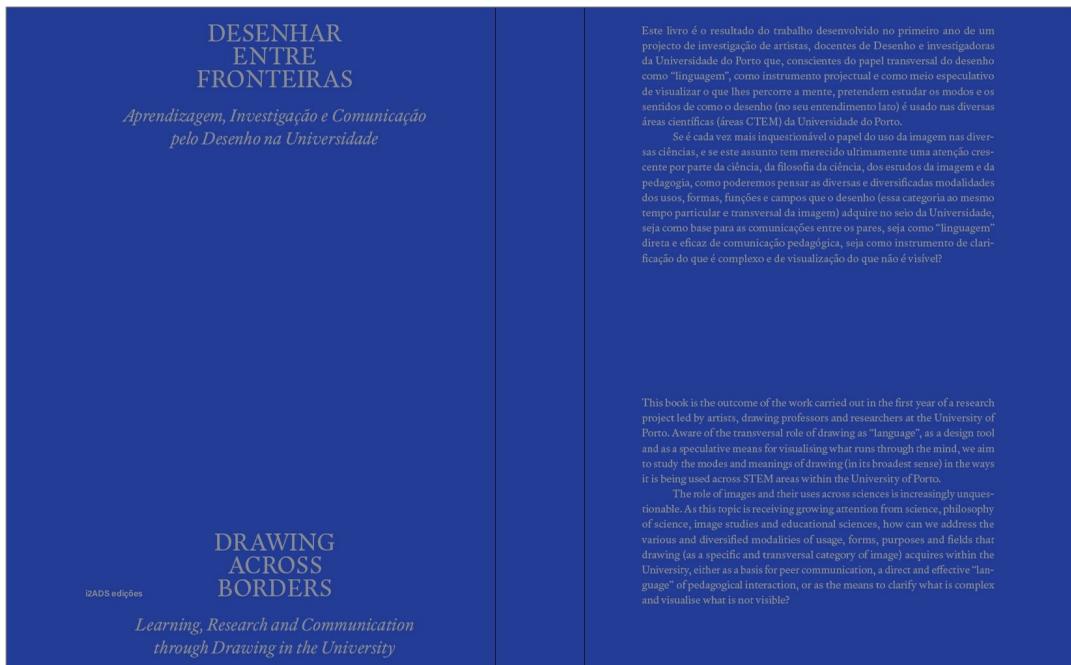
Indicadores de realização física	Propostos	Realizados anteriormente	Realizados ano 2	Total realizados	Execução
A - Publicações					
Livros	3	1	1	2	67%
Artigos em revistas internacionais	5	4	3	7	140%
Artigos em revistas nacionais	5	0	1	1	20%
B - Comunicações					
Comunicações em encontros científicos internacionais	5	7	5	12	240%
Comunicações em encontros científicos nacionais	5	3	12	15	300%
C - Relatórios					
	3	1	1	2	67%
D - Organização de seminários e conferências					
	4	2	2	4	100%
E - Formação avançada					
Teses de Doutoramento	1	1	1	2	200%
Teses de Mestrado	-	-	-	-	0
Outras	-	-	-	-	0
F - Modelos					
	-	-	-	-	0
G - Aplicações computacionais					
	-	-	-	-	0
H - Instalações piloto					
	-	-	-	-	0
I - Protótipos laboratoriais					
	-	-	-	-	0
J - Patentes					
	-	-	-	-	0
L - Outros					
Workshops	3	1	5	6	200%
Exhibitions	2	1	1	2	100%
Website / open access repository	1	1	-	-	100%

4.1. Publicações

Livros

1. BISMARCK, Mário; ALMEIDA, Paulo Luís; SIMÕES, Sílvia, SILVA, Vítor (Eds.) (2023). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições. ISBN 978-989-9049-38-3.

Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>



RESUMO:

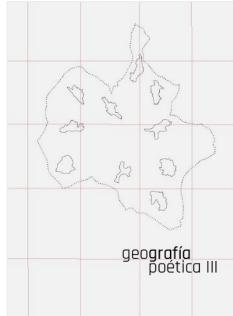
This book is the outcome of the work carried out in the first year of a research project led by artists, drawing professors and researchers at the University of Porto. Aware of the transversal role of drawing as "language", as a design tool and as a speculative means for visualising what runs through the mind, we aim to study the modes and meanings of drawing (in its broadest sense) in the ways it is being used across STEM areas within the University of Porto.

The role of images and their uses across sciences is increasingly unquestionable. As this topic is receiving growing attention from Science, Philosophy of Science, Image Studies and Educational Sciences, how can we address the various and diversified modalities of usage, forms, purposes and fields that Drawing (...)? This research plan raises and proposes a successive and infinite series of initial questions: does drawing exist at the University of Porto? Is it being used across its Faculties, Departments and Research Centres? What drawing typologies are used (schemes, annotations, illustrations, etc.)? Who draws? What do they draw? How do they draw? Why do they draw? Which purposes are addressed? Does one learn better through drawing? What kind of awareness, knowledge, or insights does someone who draws have regarding the activity of drawing? Can drawing be replaced? How can artists who draw participate in the interweaving of these problems? (...) Through these contributions, we intend to open up research and learning possibilities, raise new questions and revisit old ones, and re-inspire other persons to draw in and beyond STEM areas in the University. Overall, the present volume is neither exhaustive nor conclusive. It is an invitation to explore the collection of drawings, to pay daily attention to drawing activities that surround us at the University, and above all, to reconnect them with our research, teaching and learning processes.

CONTEÚDOS:

- [Biology] The use of drawing in the areas of biology. (Mario Bismarck)
- [Medicine] Graphic and verbal annotations as synthesising and memorising resources. (Claudia Amandi)
- [Medicine] The current presence of drawing in the context of medicine. (Marina Vale Guedes)
- [Sports] How to do sports with drawings? (Paulo Luis Almeida)
- [Physics] Diagrams, schemes and figures. (Jorge Marques)
- [Mathematics] Drawing to visualize in mathematics. (Helena Mena Matos, Vasco Cardoso)
- [Engineering] Drawing, creativity and communication. (Silvia Simões, Pedro Alegria)
- [Archaeology] To inquire, to prove and to reconstitute. (Vasco Cardoso)
- [Architecture] Drawing practices at the Faculty of Architecture of the University of Porto (Vitor Silva)

Artigos / Capítulos de livro internacionais



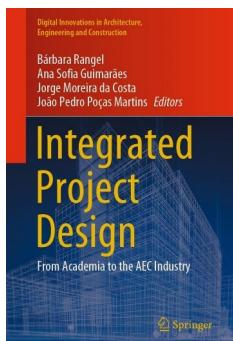
01. ALMEIDA, Paulo Luís (2023). **Anemos – Una práctica de viento / Anemos – a wind practice.** In Fernández, Holga Méndez; Atienza, Belén Díez (Eds.) (2023). *Geografía Poética III*. Servicio de Publicaciones, Universidad de Zaragoza, pp. 35-41, ISBN 978-84-18418321-89-4.
<https://doi.org/10.26754/uz.978-84-18321-88-7>

ABSTRACT: This chapter is a reflective review of 'Anemos,' an anonymous intervention carried out with the movement of the wind in Serra da Lousã. The practice that underlies it relates the positioning of Poetic Geography to ways of testing the body's movement in situations of voluntary submission to unnecessary obstacles within the context of project DRAWinU, ongoing at the time of my writing (...).



02. GUEDES, Marina Vale. (2023). **Desenho e Observação para Médicos: o desafio de ensinar os estudantes de medicina a desenhar.** In *Confia 2023 - 10th International Conference on Illustration and Animation*. Edições Instituto Politécnico do Cávado e do Ave, pp. 567-575. ISBN: 978-989-54939-9-9. Disponível em: https://confia.ipca.pt/2023/files/confia_2023_proceedings.pdf

ABSTRACT: Drawing and observation for doctors is a course of drawing specially created for medicine and dentistry students at the University of Porto. (...) Considering that teaching within medicine context is based on the observation of the human body and the images that represent it, the practice of drawing can become useful not only in understanding anatomy but also as an important tool for communication between doctors and patients. (...) The development of this course is part of the research project DRAWinU – Drawing Across University Borders (i2ADS-FBAUP).



03. SIMÕES, Sílvia, ALEGRIA, Pedro (2023). **Drawing in the University Today: A Tool to Think in Engineering.** In Rangel, B., Guimarães, A.S., Moreira da Costa, J., Poças Martins, J.P. (eds). *Integrated Project Design. Digital Innovations in Architecture, Engineering and Construction*. Springer, Cham, pp. 53-83. https://doi.org/10.1007/978-3-031-32425-3_3

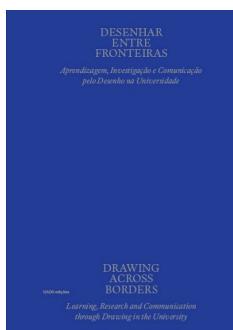
ABSTRACT: (...) We present a case study from the University of Porto, focusing particularly on the study of engineering and its direct involvement with drawing issues. We discuss the concept of drawing and the respective mechanisms of divergence and convergence that are enmeshed in the methodologies used in projectual processes and in which drawing is an instrument of conception and mediation, a tool, and a means of graphic communication.

Artigos / Capítulos de livro nacionais



04. ALMEIDA, Paulo Luís (2023). **How is Artistic Research Challenging Art, Design and Science in the University?**. In Carvalhais, Miguel; Amado, Pedro (Eds). *Field Theory: Artistic Research in Light, Air, and Matter*. I2ADS Editions. ISBN 978-989-9049-43-7, <https://doi.org/10.34626/2023-XYF8-MB09>

ABSTRACT: The past three decades have witnessed the appearance of a new debating space within and beyond academic sectors. Artistic research's (...) impact in the context of mission-oriented research and as a response to societal challenges is gaining increasing relevance. (...) Today, the debate is shifting as the natural differences between artistic and scientific forms of inquiry are becoming increasingly irrelevant. What gains relevance is the transformative nature of research. (...)



05. ALMEIDA, P. L. (2023). **Como fazer desporto com desenho? / How to do sports with drawings**. In Bismarck, Mário et. al (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 177-224. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

06. AMANDI, C. (2023). **Organizar a complexidade. As anotações gráficas e verbais como recursos de sintetização e memorização / Organising complexity. Graphic and verbal annotations as synthesizing and memorising resources**. In Bismarck, Mário et. al (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 81-128. ISBN 978-989-9049-38-3'. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

07. BISMARCK, M. (2023). **O uso do desenho nas áreas da biologia. Desenhar para aprender, desenhar para ensinar, desenhar para investigar, desenhar para comunicar / The use of drawing in the areas of biology. Drawing to learn, drawing to teach, drawing to research, drawing to communicate**. In Bismarck, Mário et. al (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 33-80. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

08. CARDOSO, V. (2023). **Inquirir, provar e reconstituir: apontamentos sobre o desenho na arqueologia / To inquire, to prove and to reconstitute: notes on drawing in archaeology**. In Bismarck, Mário et. al (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 369-416. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

09. GUEDES, M. V. (2023). **A atual presença do desenho no contexto da medicina: desenhar para ensinar, estudar e comunicar / The current presence of drawing in the context of medicine: drawing to teach, study and communicate**. In Bismarck, Mário et. al (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 129-176. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

Capítulos de livro



10. MARQUES, J. (2023). **Diagramas, esquemas e figuras. Visualização e representação de conceitos em física e astronomia / Diagrams, schemes and figures. Visualisation and representation of concepts in physics and astronomy.** In Bismarck, Mário *et. al* (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 225-272. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>
11. MATOS, H. Mena & CARDOSO, Vasco (2023). **Desenhar para visualizar na matemática / Drawing to visualize in mathematics.** In Bismarck, Mário *et. al* (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 273-320. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>
12. SILVA, V. (2023). **As práticas de desenho na Faculdade de Arquitectura da Universidade do Porto: método, investigação, teoria / Drawing practices at the Faculty of Architecture of the University of Porto: method, research, theory.** In Bismarck, Mário *et. al* (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 417-463. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>
12. SIMÓES, S. & ALEGRIA, P. (2023). **Desenho, criatividade e comunicação. A importância do desenho na engenharia / Drawing, creativity and communication. The importance of drawing in engineering.** In Bismarck, Mário *et. al* (Eds). *Drawing Across Borders – Learning, Research and Communication through Drawing in the University*. i2ADS Edições, pp. 321-368. ISBN 978-989-9049-38-3. Disponível em: <https://i2ads.up.pt/en/publicacoes/desenhar-entre-fronteiras/>

4.2. Comunicações

Encontros Científicos Internacionais

1. ALMEIDA, Paulo Luís (22.08.2023). **Drawing the Game. An A/R/Tography Approach to the Body and its Movements in Sport** [Conference presentation; call submission]. ECER 2023. 29 SES 01 A: Approaches to Different Artistic Fields in Education Research. University of Glasgow, 22-25 August 2023. Available at <https://eera-ecer.de/ecer-2023-glasgow>

ABSTRACT: In sports, as in other areas of Higher Education, drawing activities are rarely seen as a teaching and research method capable of producing knowledge, sustaining arguments or addressing theoretical content. And yet, visualization methods such as time-motion analysis, motion capture or performance analysis rely on visual-spatial content that we apprehend as a drawing skill (...) Since 2021, we have been studying the use of drawing activities within sports training and research in the Faculty of Sports of the University of Porto (FADEUP) in Portugal and the Porto Biomechanics Laboratory (LABIOMEP). We intend to contribute to the visibility of drawing as a skill in sports education and to develop a framework to promote research and implementation of drawing activities in dynamic sports situations.

Using an a/r/tographic approach to the learning processes in sports, our presentation proposes a reflection on the intersection of two territories: sports sciences and drawing-based practices. We intend to discuss distinct ways of representing the body in motion as weight, flow, space and time. Beyond drawing as an observational and visualization process, recent literature has shown that drawing in sports also opens up a space for introspection in which we can understand the limits of our bodies and the emotional and physical contours that we create between ourselves and the world.

Despite their differences, there are significant parallels between sports performance and drawing-based performance practices that can benefit from a common approach to the different layers of the physical body in motion. (...) By intertwining different modes of perception, such as vision or touch, body movement and introspection, drawing can be a means of accessing the awareness that athletes, coaches and scientists have of the states and emotions of the body in sport. These states are rarely represented only by verbal language or statistical data. This background implies advocating for an expanded sense of observation and motion in sports, with an impact on the assessment of movement in qualitative/formal sports, the development of reflective practices in exercise and sports for social change.

2. ALMEIDA, Paulo Luís, BISMARCK, Mário (24.08.2023). **Polarize and Depolarise – Drawing to Learn Under the Microscope** [Conference presentation; call submission]. ECER 2023 — *The Value of Diversity in Education and Educational Research*. 29 SES 01 A: Approaches to Different Artistic Fields in Education Research. University of Glasgow, 22-25 August 2023. Available at <https://eera-ecer.de/ecer-2023-glasgow>

ABSTRACT: Recent literature on drawing as a means of tacit communication between professors and students in learning microscopy has highlighted its benefits in overcoming resistance to absorbing new information quickly. The habit of drawing for colleagues and students is a natural and necessary consequence of joint observation under the microscope to learn to select and organise information. Drawing together becomes an alternative way of "talking to each other" (Lyon & Turland, 2020, p.7). Drawing as a process of microscopic observation suggests that there are different levels of cognitive engagement between the external visual models generated by students and the mental models that are formed in the student's mind (Ainsworth & Scheiter, 2021). Studies on the role of drawing in STEM areas highlight this interaction, as the brain naturally resorts to spatial information to encode other information, such as verbal or numeric, thus increasing memory and learning capacity (Quillin & Thomas, 2015; Tversky, 1999). Drawing a physical or visual model, such as a microscopic slide, can occur as a result of an already constituted mental model or as part of the cognitive tasks of selecting, organising and integrating information, which structures the learning process and the creation of mental models (Van Meter & Garner, 2005). This presentation will discuss a "Drawing to Learn" experience based on a drawing workshop under the microscope. This workshop gathered Fine Arts and Biochemistry students from the University of Porto around biological samples prepared with the tano-ferric method by the Portuguese scientist Abel Salazar (1889-1946). Drawing as collaborative practice between students with different backgrounds is used to question our assumptions of fundamental notions of Science and Technology Studies such as "truth" or "true form". Through drawing practice, it is intended to extend the critique of representation from language and logic to nonverbal, often visual practices and formats that are constructed by instrumental interventions.



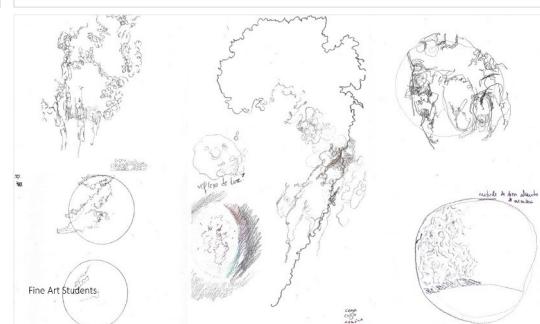
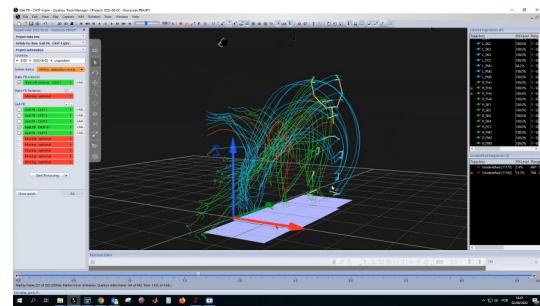
ECER 2023, Glasgow

Thursday August 24, 2023 / 09:00 AM - 10:30 AM

“ Polarize and Depolarise – Drawing to Learn Under the Microscope ”

Paulo Luís Almeida

Powered by Whova



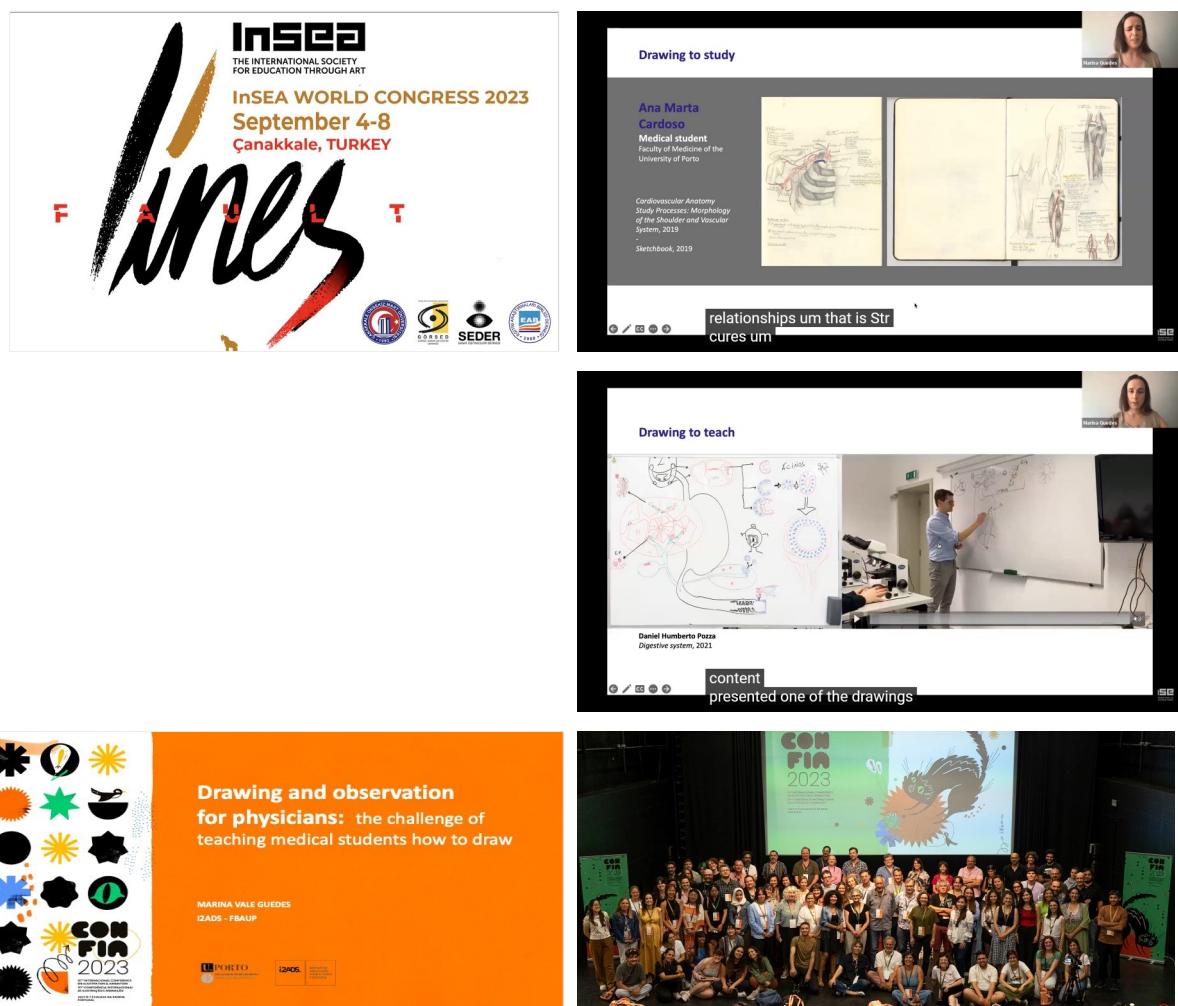
3. GUEDES, Marina Vale (08.09.2023). **Why do Medical Students and Teachers Draw in the University Today?** [Conference presentation; call submission]. In *Fault Lines - InSEA World Congress 2023*. Çanakkale, Turkey, 4 — 8 September 2023.

Available at <https://www.insea.org/insea-world-congress-2023-virtual-day/>

ABSTRACT: The history of Medicine reveals the use of Drawing as an important tool to observe and configure the human body, highlighting the possibility to communicate scientific discoveries through graphic representations. Despite this historical context, is drawing actively playing a role in Medical Schools today? It is understood that drawing can be useful in the development and teaching of Medicine, portraying ideas, knowledge, and experiences that shine through the historical evolution of this discipline. As the relationship between both areas evolves, the contribution of drawing expanded beyond its initial boundaries within Medicine. A few examples are its ability to create useful images for understanding and learning anatomy among other subjects and become a useful and powerful tool to communicate visually between teachers and students. Based on this ground, we will seek to analyze the presence and utility of drawing inside Medical Schools at the University of Porto. In this process, we will understand how drawing is a vital tool to visualize knowledge, learn contents and memorize the intricate nature of the human body. This analysis integrates the investigation project *DRAWinU* which aims to understand the uses of drawing between teachers, students, and researchers within the University of Porto, highlighting the purpose of creating new learning strategies and research skills based on drawing activities in Higher Education.

4. GUEDES, Marina Vale (07.07.2023. Drawing and observation for physicians: o the challenge of teaching medical students how to draw [Conference presentation; call submission]. CONFIA — 10th International Conference on Illustration and Animation, Caldas da Rainha, Portugal, 6-7 July 2023. Available at: <https://confia.ipca.pt>

ABSTRACT: Drawing and observation for doctors is a course of drawing specially created for medicine and dentistry students at the University of Porto. This course challenges students to recognize the importance of drawing and its visual language as a learning tool to support their academic training. Considering that teaching within medicine context is based on the observation of the human body and the images that represent it, the practice of drawing can become useful not only in understanding anatomy but also as an important tool for communication between doctors and patients. The possibility of understanding and communicating through their images helps to consolidate and complement cognitive and communication skills relevant to their areas of training. The development of this course is part of the research project *DRAWinU*.



Encontros Científicos Nacionais #1



1. ALMEIDA, Paulo Luís (25.05.2023). **Fazer Ciência com Desenhos: Outras perspetivas para a aprendizagem nas áreas CTEM / Doing science with drawings: Other perspectives for learning in STEM** [Conference presentation by invitation]. Espaços que nos unem – sessão de encerramento. Organized by FAUP & FCUP. Faculty of Sciences, University of Porto.

ABSTRACT: How do we do things with words? With this question, philosopher John L. Austin refocused the problem of the performativity of language, which, by saying something, does what it names. This illocutionary force, which transforms representation into action, underlies the activity of drawing in science. Rather than passively describing observed data, drawings create models of knowing and new perceptions linked to the visual and spatial qualities of its media. As a means of research, drawing arises from a state of not knowing - of not yet knowing - with the desire to transform ways of knowing, seeing, feeling and acting on reality. Starting from the fundamental distinction between representation and model in science, the presentation proposes a comparative reflection on fundamental cases in the history of science directly related to the activity of drawing, such as the representations of the moon by Galileo Galilei and Thomas Harriot; the drawings related to the discovery of the DNA molecule by Francis Crick and Odile Crick. The present of this relationship is approached from the point of view of representations of the body in sports science, resulting from the DRAWinU research project; and the opportunities and threats for the future of drawing in science education are discussed.

Media: <https://www.fc.up.pt/ap/espacosquenosunem/>



2. MENA-MATOS, Helena e CARDOSO, Vasco (29.09.2023). **Alguns resultados de abordagens inter e transdisciplinares à forma e ao espaço, no âmbito do Ensino Básico e Secundário: Desenho, Matemática, Geografia** [comunicação por convite]. In *VII Encontro de Ensino de Geografia na Universidade do Porto*, Museu da Escola, Ribeira de Pena.

ABSTRACT: A partir dos conceitos de inter e transdisciplinaridade, os oradores apresentaram alguns resultados da Unidade Curricular “Discursos Interdisciplinares sobre Geometria”, em que os estudantes do Mestrado em Ensino das Artes Visuais no 3.º Ciclo do Ensino Básico e no Ensino Secundário (MEAV) desenvolveram atividades docentes integradoras e inclusivas envolvendo os contributos centrais do Desenho, da Matemática e da Geografia

Media: https://sigarra.up.pt/flup/pt/noticias geral.ver_noticia?P_NR=161126



Encontros Científicos Nacionais #2

03. ALMEIDA, Paulo Luís (18.06.2023). **Como fazer desporto com desenhos?** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
04. AMANDI, Cláudia (18.06.2023). **Organizar a complexidade. As anotações gráficas e verbais como recursos de sintetização e memorização.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
05. BISMARCK, Mário (18.06.2023). **O uso do desenho nas áreas da biologia.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
06. CARDOSO, Vasco (18.06.2023). **Inquirir, provar e reconstituir: apontamentos sobre o desenho na arqueologia.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
07. GUEDES, Marina Vale (18.06.2023). **A atual presença do desenho no contexto da medicina: desenhar para ensinar, estudar e comunicar.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
08. MARQUES, Jorge (18.06.2023). **Diagramas, esquemas e figuras. Visualização e representação de conceitos em física e astronomia.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
09. MATOS, Helena Mena & CARDOSO, Vasco (18.06.2023). **Desenhar para visualizar na matemática.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
10. SILVA, Maria C. (18.06.2023). **Lançar uma nova plataforma sobre desenho entre disciplinas: inputs do DRAWinU.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
11. SILVA, Vítor (18.06.2023). **As práticas de desenho na Faculdade de Arquitectura da Universidade do Porto.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>
12. SIMÓES, Sílvia & ALEGRIA, Pedro (18.06.2023). **A importância do desenho na engenharia.** In *Depois do Desenho / After Drawing* [Seminário] Faculdade de Belas Artes da Universidade do Porto – i2ADS. Disponível em <https://i2ads.up.pt/eventos/depois-do-desenho/>

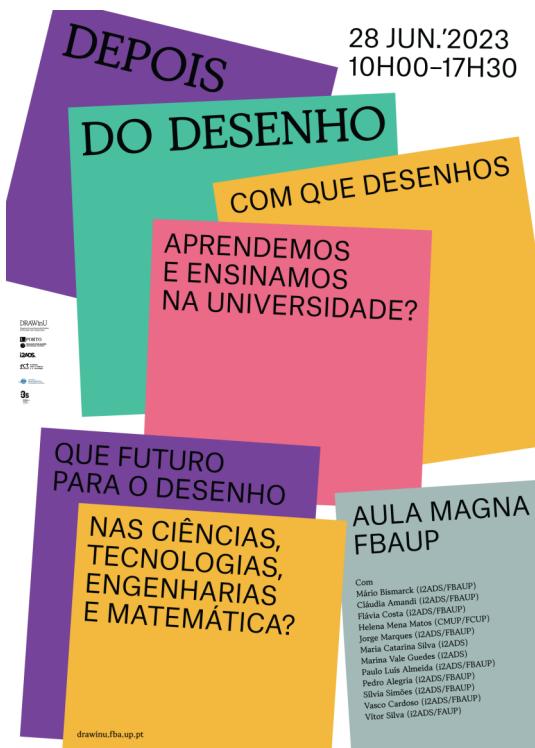
4.3. Organização de Seminários e Conferências

1. **DEPOIS DO DESENHO - Com que desenhos aprendemos e ensinamos na Universidade? Que futuro para o desenho nas Ciências, Tecnologias, Engenharias e Matemática? / AFTER DRAWING – With which drawings do we learn and teach at the University? What is the future for drawing in Science, Technology, Engineering and Mathematics?** [Seminar] (18.06.2023). Coordinated by Paulo Luís Almeida, Mário Bismarck, Sílvia Simões. Moderated by Flávia Costa. Participation by Cláudia Amandi, Flávia Costa, J. Jorge Marques, Helena Mena-Matos, Maria Catarina Silva, Mário Bismarck, Paulo Luís Almeida, Pedro Alegria, Sílvia Simões, Vasco Cardoso and Vítor Silva.i2ADS – Faculdade de Belas Artes da Universidade do Porto, Portugal.

Media: <https://noticias.up.pt/eventos/seminario-drawinu-depois-do-desenho/>

Media: <https://i2ads.up.pt/eventos/depois-do-desenho/>

Number of participants: 58



SINOPSIS: This seminar discusses the results of the first year of the DRAWinU project based on two questions:

- With which drawings are we learning and teaching at university?
- What is the future for drawing in science, technology, engineering, and maths?

The seminar is open to all audiences.

Over the last year, the DRAWinU project team has collected and identified different drawing activities in various centres and faculties at the University of Porto: from medicine to biomedical sciences, from biology to biochemistry, from sports to physics, from territorial sciences to mathematics, from engineering to architecture. This recognition is the basis of a longitudinal study on the uses of design in the STEM areas of higher education (Science, Technology, Engineering and Maths).

We aim to understand the constructive agency of drawing not only as an illustrative representation but as a multifaceted element of the epistemological process of science. We believe that this recognition cannot be disconnected from the unique perception with which students, researchers and professors consider their own drawing experience in relation to learning outcomes, the construction of knowledge and observed phenomena. The academic community, DRAWinU consultants and the University of Porto policy-makers were invited to participate in this discussion.

The seminar addressed the obstacles and incentives to teaching drawing in STEM areas and discussed which strategies are needed to develop the activity of drawing in a close relationship with the contents and practices of each area.

PROGRAMME MORNING

10:00: Welcome remarks and presentation of DRAWinU (Mário Bismarck, PI)

10:25: Seminar objectives (Paulo Luís Almeida, CoPI)

10:30: Drawing practices at the Faculty of Architecture of the University of Porto: method, research, theory (Vítor Silva)

10:45: Organising complexity. Graphic and verbal annotations as resources for synthesis and memorisation (Cláudia Amaldi)

11:00: The current presence of drawing in the context of medicine: drawing to teach, study, and communicate (Marina Vale Guedes)

11:20: Coffee break

11:30: How to do sports with drawings? (Paulo Luís Almeida)

11:45: Diagrams, schemes, and figures. Visualisation and representation of concepts in Physics and Astronomy (Jorge Marques)

12:00: Discussion (Moderation: Flávia Costa)

12:30: Lunch break.

AFTERNOON

14:15: Drawing creativity and communication. The importance of drawing in engineering (Sílvia Simões and Pedro Alegria)

14:30: Inquiring, proving, and reconstructing: Notes on drawing in archaeology (Vasco Cardoso)

14:45: Break

15:00: Drawing to Visualise in Mathematics (Helena Mena Matos and Vasco Cardoso)

15:15: The use of drawing in the areas of biology. Drawing to learn, draw to teach, draw to investigate, draw to communicate (Mário Bismarck)

15:30: Discussion (Moderation: Flávia Costa)

15:45: Break

16:00: Presentation of the online repository of the DRAWinU project (Maria Catarina Silva)

16:10: Discussion: what future for drawing education between the two cultures of the university?
(Moderation: Flávia Costa)

16:45: Coffee break

17:30: Conclusion of the seminar





2. REPRESENTATIONS, DRAWINGS AND IMAGES OF THE TERRITORY 2023. Cycle of Open Conferences RDIT/DRAWinU. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP).

Número de Participantes: 202 (cinco sessões)

SINOPSIS: The 2023 cycle of open conferences "Representations, Drawings and Images of the Territory" stems from the task "Drawing Activities in Territorial Sciences" of the DRAWinU project and its dissemination to the artistic and STEM community. In this edition, the cross-cutting readings of the territory through drawing will come from the discovery of some of the results of five fundamental and applied research projects in different areas of knowledge, also investigated from an inter- and transdisciplinary perspective: from Art to Science and Technology.

The 2023 programme maintains the usual structure: five conferences with free access. The five people responsible for each project, our guest speakers, will give the lectures. It is interesting to learn about the role of drawing in constructing the images generated and included in each research project. The aims of the lectures remain the same: to sow in students contributions to the foundation and development of their own graphic construction projects about the territory; to publicise and engage citizens in the importance of the territory as a common, shared space through knowledge of the representations that each one has and projects, individually or in groups, within the third mission of the University of Porto.

#1 Geografia Poética (22.03.2023). Com **Holga Méndez** (Universidad de Zaragoza) [Keynote Adress]. In *Representações, Desenhos e Imagens do Território #1, 4ª Edição*. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP). Gondomar: Lugar do Desenho-Fundação Júlio Resende.

Media: https://sigarra.up.pt/feup/pt/noticias_geral.ver_noticia?p_nr=147750

Media: https://sigarra.up.pt/fbaup/en/noticias_geral.ver_noticia?p_nr=28682

ABSTRACT: Geografía Poética es un proyecto artístico originado en la Facultad de Ciencias Sociales y Humanas de Teruel de la Universidad de Zaragoza (España), con el patrocinio del Ayuntamiento de Teruel y la Fundación Universitaria “Antonio Gargallo”. Desde las prácticas artísticas en contexto se da voz y visibilidad a las relaciones interpersonales – humanas y no-humanas, que se presentan en los 10 Barrios rurales de Teruel. Nos ubicamos en una de las zonas rurales reconocidas de montaña y transfronterizas, punto estratégico en las conexiones terrestres nacionales; sin embargo esta realidad física es precaria. Imaginar una nueva narrativa sobre lo rural a partir de la producción cultural contemporánea nos permite activar estas zonas de nuestro territorio amenazadas por la despoblación y el aislamiento. Geografía Poética sitúa en el mapa artístico y vivencial el territorio y el patrimonio cultural y natural de Teruel, junto al compromiso ético y estético del trabajo desarrollado por su comunidad en un intercambio de afectos y saberes intergeneracionales que con la mediación del arte y el ecofeminismo –como educación emocional ecológica– nos ofrecen cultivar la solidaridad, la emoción estética ante lo natural y la emoción ética del cuidado, bases para alcanzar la sostenibilidad y la regeneración.

#2 Desenho: do PNPOt aos PROT (12.04.2023). Com **Teresa Sá Marques** (Departamento de Geografia, Universidade do Porto) [Keynote Adress]. In *Representações, Desenhos e Imagens do Território #2, 4ª Edição*. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP). Gondomar: Lugar do Desenho

Media: https://sigarra.up.pt/flup/pt/noticias_geral.ver_noticia?p_nr=155486

ABSTRACT: O desenho de políticas públicas de ordenamento do território inspira-se em leituras cartográficas que vão sendo desenhadas e aprofundadas. Os mapas vão exprimindo a diversidade territorial e inspirando os modelos territoriais que devem orientar as políticas. Altas e baixas densidades populacionais, vários níveis de acessibilidade, áreas de influência da oferta de serviços coletivos, e valores ambientais e sistemas agroflorestais cruzam-se na construção de mosaicos territoriais. As morfologias também exprimem as injustiças espaciais, a maior ou menor resiliência dos territórios, os níveis de bem-estar e a capacidade de inovação social, económica ou ambiental. Parte-se do território físico, natural ou edificado, passa-se para o território social, das idades, qualificações ou rendimentos, e junta-se o território relacional, dos nós, dos fluxos e das redes de governança. As conjugações das cores cruzam temáticas, as graduações transmitem intensidades, as cores frias e quentes conjugam perspetivas e orientações,umas identificando estratégias a promover, outras a contrariar. (...) Do PNPOt aos PROT, os desenhos foram evoluindo a partir de uma matriz de informação mais sólida, que vai desenvolvendo retratos e dinâmicas a diferentes escalas, produzindo conhecimento territorial. A conceção das políticas públicas pode sustentar-se nas evidências territoriais, mas também nas aspirações e em perspetivas transformadoras de desenvolvimento. As políticas públicas de ordenamento do território têm desenho(s).

#3 CANVAS: A Cartografia da Criminalidade: os Sistemas de Informação Geográfica na Tomada de Decisão (26.04.2023). Com **Miguel Saraiva** (Faculdade de Engenharia, Universidade do Porto) [Keynote Adress]. In *Representações, Desenhos e Imagens do Território #3, 4ª Edição*. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP). Gondomar: Lugar do Desenho.

Media: https://sigarra.up.pt/flup/pt/noticias_geral.ver_noticia?p_nr=155466

ABSTRACT: A Segurança Urbana e Humana são prioridades fundamentais das sociedades e, consequentemente, pilares integrantes das mais recentes estratégias associadas ao desenvolvimento de sociedades coesas, sustentáveis e inclusivas. Apesar de sempre se ter reconhecido uma associação entre a (in)segurança e o lugar (...) tradicionalmente estas matérias pertenciam aos domínios de ciências como a criminologia, a sociologia ou as ciências policiais. Só a partir da década de 1970, com o surgimento da chamada criminologia ambiental, é que o papel das disciplinas associadas ao Planeamento e Ordenamento do Território começou a ser valorizado (...) com a proliferação da capacidade de representação e análise proporcionada pelos Sistemas de Informação Geográfica. O “lugar importa”, porque a distribuição de incivilidades varia geográfica e temporalmente, fruto de condições territoriais específicas. Porém, os processos de georreferenciação, representação cartográfica e análise espacial são ainda uma prática pouco comum nalguns contextos, incluindo o português. Reenvendo o historial (inter)nacional da cartografia criminal e das várias formas de representação da insegurança no espaço, esta palestra apresenta o que foi o projeto CANVAS (2018-2022); uma parceria entre a Faculdade de Letras da Universidade do Porto e as Organizações de Segurança, com o intuito de gerar conhecimento espacial – e de como o representar – relativo à criminalidade registada, desde uma escala macro (nacional) a uma escala micro (municipal).

#4 ARS & URBS: Representación pictórica de la ciudad, del siglo XVI al siglo XIX: Perspectivas, Corografías e Panoramas (15.05.2023). Com **Raúl Campos López** (Universidad de Granada) [Keynote Adress]. In *Representações, Desenhos e Imagens do Território #4, 4ª Edição*. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP). Gondomar: Lugar do Desenho.

Media: https://sigarra.up.pt/flup/pt/noticias_geral.ver_noticia?p_nr=155506

ABSTRACT: El proyecto de investigación “Representación pictórica de la ciudad” (Plan Nacional I+D HAR2016-78298-P) pretende acometer un estudio selectivo e innovador aquellos documentos gráficos (dibujos y pinturas en perspectiva) producidos en la Península Ibérica en el período comprendido entre el siglo XVI hasta la introducción de la fotografía, cuya temática específica es la representación de la ciudad. Señalamos como elemento destacado que el estudio prioriza los aspectos vinculados con la práctica artística (dibujo, proyecciones y perspectiva), los procedimientos técnicos e instrumentación (matemática y óptica según la cronología) con los que se realiza esta tipología de imágenes. De este modo, entendemos que el análisis procedural, técnico y artístico de la representación de la ciudad permitiría completar y equilibrar las aportaciones de otros enfoques ya constatados en la literatura científica actual como pueden ser desde la Historia del Arte o la Historia de la Ciencia (arquitectura e ingeniería civil y militar).

#5 El Paisaje que Habla (22.05.2023). Com **Carles Oliver Torelló** (Universitat de les Illes Balears) [Keynote Adress]. In *Representações, Desenhos e Imagens do Território #5, 4ª Edição*. Org. Vasco Cardoso (DRAWinU), Mário Gonçalves Fernandes (Dep. Geografia da FLUP) e Carlos Rodrigues (Dep. Engenharia Civil da FEUP). Gondomar: Lugar do Desenho-Fundação Júlio Resende.

Media: https://sigarra.up.pt/flup/pt/noticias_geral.ver_noticia?p_nr=155507

ABSTRACT: Se tratan algunos aspectos vinculados a los logros obtenidos en el proyecto estatal de investigación en curso I+D+i El paisaje que habla. Marco teórico y referencias culturales interdisciplinares. México, Portugal y España como escenarios. En este sentido, se aportan conocimientos y enfoques vinculados al análisis de la representación del paisaje en época contemporánea desde metodologías derivadas de la interpretación histórico-artística del paisaje y su dimensión comunicativa. Integraremos un conjunto de propuestas en el campo del arte contemporáneo, la arquitectura, la musicología, los New Media, la memoria histórica y el patrimonio cultural. El proyecto busca profundizar en algunos ejes de contenido en los que se detectó la necesidad de realizar trabajos de investigación transversales. En estos, subyace una premisa clara y continua que abraza todo el proyecto: la representación del paisaje (visual, sonora, plástica, literaria, oral, patrimonial, virtual, etc.) nos “habla”, a través de un lenguaje interdisciplinar, de fenómenos históricos, culturales y artísticos.



4.4. Workshops

1. Desenho de mapas metabólicos: simplificar a complexidade / Drawing metabolic maps: simplifying complexity (03.05.2023) [workshop]. Oriented by Mário Bismarck and Paulo Luís Almeida (i2ADS-FBAUP). Organized by Mário Bismarck (i2ADS-FBAUP), Paulo Luís Almeida (i2ADS-FBAUP), Marina Vale Guedes (i2ADS-FBAUP), Maria Stretch de Almeida (ICBAS), Ana Magalhães (IPATIMUP-ICBAS) and Isabel Cardoso (IPATIMUP-ICBAS). Porto: ICBAS - School of Medicine and Biomedical Sciences.

Number of Participants: 15

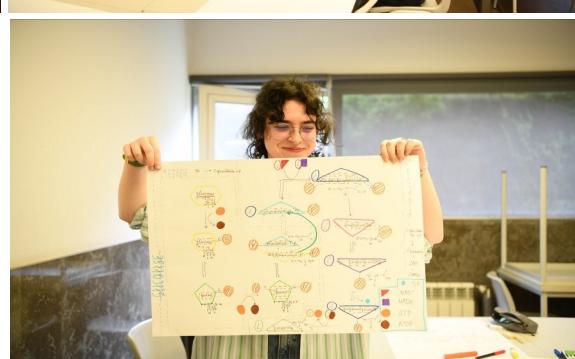
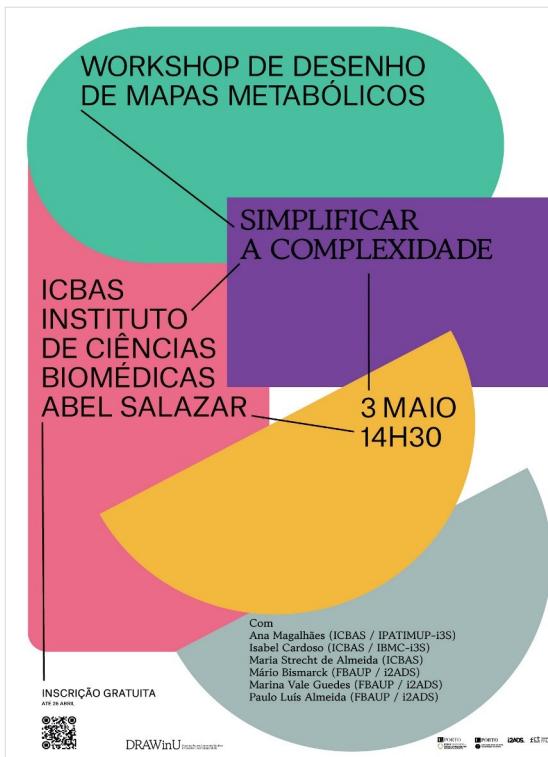
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Media: <https://i2ads.up.pt/eventos/workshop-de-desenho-de-mapas-metabolicos-simplificar-a-complexidade/>

SINOPSIS: The metabolism and its regulation are central aspects of training in Biochemistry. A metabolic map represents a set of enzymatic reactions and their interrelationships, describing cells' physiological and pathological processes. Creating these representations constitutes a challenge, and in this context, it is important to explore the drawing of metabolic maps as an integral tool of the learning process. The collaborative workshop on biochemistry and drawing, voluntary participation, was proposed as an extracurricular activity. This activity, of visual-spatial content, sought to develop a new reflective approach to the subject matter in partnership with the Faculty of Fine Arts of the University of Porto / i2ADS - Institute of Research in Art, Design, and Society, within the scope of the research project DRAWinU - Drawing Across University Borders (PTDC/ART-OUT/3560/2021).

The workshop was aimed at students from the study cycles of ICBAS, and it also counted on the collaboration of two teachers who participated in it. It included students from the Doctoral Program in Biomedical Sciences, Master PNI, MIMV, Master's in Cellular and Molecular Biology, Master's in Biochemistry, and Bachelor's in Biochemistry. The objective was to explore visualisation modes of the glycolysis cycle as a concrete problem of representing metabolic maps. Since most students are familiar with the biochemical process of glycolysis molecule transformation, some of the most common representation models were addressed, and collaborative strategies were explored to describe the various phases of the process. Representing biology as a process is a fundamental aspect of the new questions raised by science studies. Divergent thinking strategies were used to facilitate memorisation, particularly analogies between images and phases of the biochemical process. As a result, a new problem was noted: the difficulty reconciling the diagrammatic representation of the metabolic process with its location within the cell. This issue will continue in a new workshop to explore the representation of these two angles.





2. Desenho táctil: manipular para conhecer e representar a osteologia humana / Tactile drawing: manipulating to learn about and represent human osteology [Workshop] (24.05.2023)
 Oriented by (i2ADS). Organized by Ana Marta Cardoso (FMUP). Faculty of Medicine of the University of Porto.
 Number of Participants: 7

Media: <https://i2ads.up.pt/eventos/workshop-de-desenho-tactil/>

SYNOPSIS: The drawing experience presupposes the manipulation of the materials and tools used to reveal the grapheme of the elements inscribed on the support. Regardless of the starting point linked to imagination or perception of observed reality, the hand may incorporate the function of a seismograph that holds the ability to record the information transmitted to it. This seemingly ancillary function may be subverted when considering the importance of touch in gathering data crucial for constructing exploratory representations of the human body's skeletal system. Building on this assumption, the Tactile Drawing workshop promotes a set of sensory experiences that privilege direct contact with osteology as a way of knowing, analyzing, and representing shapes, volumes, and textures, among other characteristics that can be revealed through touch. In a complementary process between observation and the possibility of feeling different types of bones, adding more information to the drawing is possible, thus enriching the exercise of representation.

The Tactile Drawing workshop focused on sensory experiences that explored drawing activities in direct contact with human osteology. Touch was the starting point for the construction of various representations linked to the analysis of shapes, volumes, and textures. In a complementary process between observation and the action of feeling different types of bones, the possibility of adding more information to the drawing was considered, thereby expanding the knowledge about these structures.



3. The Visualisation of Interoception: Drawing the feelings and sensations that we have inside us [Workshop] (27.07.2024). Oriented by Garry Barker (Leeds Arts University). Organised by Maria Manuela Lopes (i3S), Paulo Luís Almeida (i2ADS) and Marina Vale Guedes (i2ADS). I3S – Institute of Research and Innovation in Health, University of Porto.

Number of participants: 15

Media: <https://i2ads.up.pt/eventos/visualizar-a-interocepcao/>

<https://drawinu.fba.up.pt/the-visualisation-of-interoception-drawing-the-feelings-and-sensations-that-we-have-inside-us/>

SINOPSIS: This workshop was centred on the drawing of visualisations of interoceptive sensations. (Interoception is the collection of senses providing information about the internal state of the body.) The artist Garry Barker has been working with individuals trying to help them find ways of visualising the somatic feelings that they have when various physical and/or psychological effects trigger inner body sensations. Sometimes these images slide between visual invention and people's memories of past experiences, between physical resemblances to other objects or a more abstracted understanding of the expression of feeling. The workshop was designed to help people explore how images that can arise unbidden from the unconscious when trying to visualise a particular somatic experience, can be crystallised or taken further so that they can be used as part of an evolving visual communication system. We also explored how interoceptual awareness helps with a growing awareness of how the body knows itself and its own metaphors. As the process of drawing and image making develops, we look at how sensations associated with internal body perceptions, can lead to a greater somatic awareness and as we do so hopefully we all become more attuned to what our bodies are telling us and we make a series of images that can eventually lead to the development of a visual language that cuts through verbal language barriers.

The workshop was divided into two parts. In the morning, Garry Barker addressed his own collaborative work in addressing the representation of interoception sensations and present the participants with a state of art discussion on the problem. Participants were then encouraged to develop drawings in two different directions: first, based on drawing as invention, to generate representations than can address their sensations; second, to see if the drawings can communicate that same sensation to another person. Through the discussion, the drawings were reviewed and remade. In the afternoon, the workshop developed into a more collaborative way, as participants were engaged in drawing-writing-telling strategies.

WORKSHOP COLABORATIVO



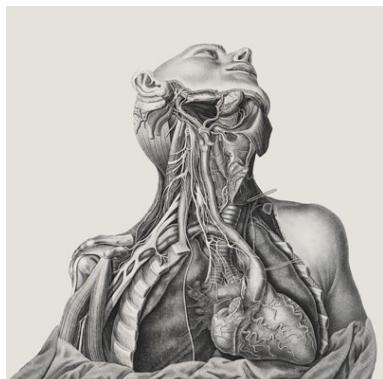


4. Brains out: drawing through augmented reality models [workshop] (16.09.2023). Oriented by Eliana Santiago (i2ADS-FBAUP). Organised by Eliana Santiago (i2ADS-FBAUP), José Paulo Andrade (FMUP) and Marina Vale Guedes (i2ADS-FBAUP). Faculty of Medicine.

Number of participants: 12

Media: <https://yesmeeting.org/18th-yes-meeting/workshops>

SINOPSIS: Knowing and mastering the anatomy of the human body is key for medical students. When they are in the process of observing and analysing the internal systems, the use of visual models is essential to reinforce learning, understanding and memorising information. In such context, Brains Out: Drawing through augmented reality models is a workshop that promotes a journey through the anatomical structures of the brain, based on the use of augmented reality models that favor the visualisation of new three-dimensional perspectives. The possibility of observing and manipulating the brain using pen tablets invites students to understand more deeply a set of theoretical and practical concepts that can be consolidated through the exercise of drawing. In the complementary action between the observation of three-dimensional models and the challenge of representation, the introduction of digital drawing will make it possible to address different visualisation techniques and information synthesis to explore new learning processes and knowledge acquisition. Following a path that begins with the discovery of the brain and culminates with the experience of drawing, the aim of the workshop is to provide students with tools and study methods that can be useful during their medical training.





5. Mapeando territórios: Desenho e representação do espaço / Mapping territories: Drawing and the representation of space [Workshop] (11.10.2023 - 25.10.2023). Oriented by Flávia Costa, Pedro Alegria e Sílvia Simões (DRAWinU-i2ADS). Organized by Ana Sofia Guimarães and Bárbara Rangel (FEUP/DEC), Flávia Costa, Pedro Alegria and Sílvia Simões (DRAWinU-i2ADS). Faculty of Engineering of the University of Porto.

Number of participants: 15

Media: <https://i2ads.up.pt/eventos/mapeando-territorios-desenho-e-representacao-do-espaco/>

SYNOPSIS: Understanding space and its representation are fundamental in the training of Civil Engineering. A specific space is determined by a set of relationships that define and identify it. Representing these relationships constitutes a challenge, and it is in this context that exploring drawing in the representation of these spaces as an integral tool of the learning process is important.

The collaborative workshop on civil engineering and drawing, consisting of 3 sessions with voluntary participation, is proposed as an extracurricular activity. This activity, of visual-spatial content, seeks to develop a new reflective approach to the subject matter in partnership with the Faculty of Fine Arts of the University of Porto / i2ADS - Institute of Research in Art, Design, and Society, within the scope of the research project DRAWinU - Drawing Across University Borders (PTDC/ART-OUT/3560/2021).

The workshop is aimed at students of FEUP and aims to equip participants with analysis, representation, and communication skills of space through drawing activities.

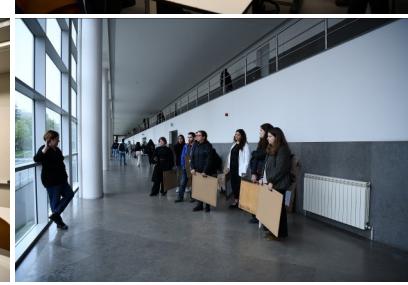
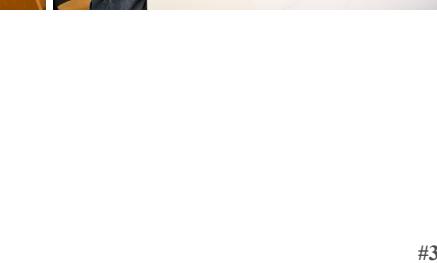
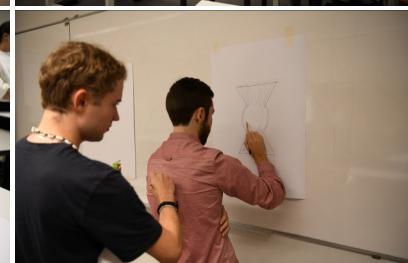
#1 Drawing and perspective. Exploring spatial representation (11.10.2023). Oriented by Pedro Alegria (i2ADS-FBAUP). Faculty of Engineering of the University of Porto.

#2 Optic and Haptic Drawing (18.10.2023). Oriented by Flávia Costa (i2ADS). Faculty of Engineering of the University of Porto.

#3 Drawing negative spaces: Exploring spatial representation through absences (25.10.2023). Oriented by Sílvia Simões (i2ADS-FBAUP). Faculty of Engineering of the University of Porto.

WORKSHOP DE DESENHO





4.5. Formação Avançada

Teses de Doutoramento

1. COSTA, Flávia M. M. (20.09.2023). **NO SPACE. Disposable architectures of the city – A drawing-based research** [Doctoral Thesis]. Supervised by Paulo Luís Almeida. Faculty of Fine Arts, University of Porto. Available at: <https://repositorio-aberto.up.pt/handle/10216/156564>

ABSTRACT: NO SPACE. Disposable architectures of the city – A drawing-based research is an artistic research project that addresses the construction of the intermittent visibility of specific structures - disposable architectures - in different cities: Nova de Cerveira (Portugal), Barcelos (Portugal), Porto (Portugal), Helsínquia (Finlândia), e Bilbao (Pais-Vasco, Espanha). By throw-away architectures, a term coined by Allan Kaprow (throw-away architecture, 1966), we mean temporary structures reconfiguring our perception of urban space without decisively altering it: barricades, fences, tents, stages, containers, scaffolding. However, their fleeting meaning hinders both our apprehension and how we can communicate with them in their relationship with the city.

In the process of making this temporality visible, we approach the concept of hyperdrawing (Marshall and Sawdon, 2012), a drawing located between dimensions, and drawing of an activist nature, an activist drawing (Deutsche, 2001), which claims the right to the city and allows us to represent space as an event (Tschumi, 2001). For this, it was relevant to experience in situ in each city according to a relational perspective with space, based on the notion of throwntogetherness by Doreen Massey (2005). This means that the random encounters with the difference and diversity of contexts, in this case of disposable architectures, inform the means and processes of representation.

From the direct experience of space, which encompasses a visual but also haptic apprehension, we resort to the intersection of knowledge coming from cartography as a rhizomatic investigation method (Deleuze and Guattari, 1997), from the sensorial ethnography of Pink (2009) and from the models of anthropology that refocus drawing as a way of studying places. And that, as a whole, they are assumed as research methods to consolidate the ways in which drawing deals with the temporality of these structures, making this temporality visible.

By preferring the sensitive dimension of walking as a creative practice, it was possible to describe and represent spaces as a mapping process (Vaughan, 2013). But thinking about the unmarked territory of disposable architectures implied, therefore, conceiving the movement of the body of those who represent and disposable architectures as elements that work reciprocally, where perception and action must be thought of as operative categories of drawing. It is in this sense that we argue that the cognitive processes involved in understanding space are revealed in the representations we make of it, such as the experiential model (marks produced by the mobility of the body) and the formal model (axioms expressed in formal languages such as the maps) (Mark and Frank, 1996).

Not forgetting that the shape, layout and spatial organization of these structures in the landscape also condition our movement and are directly involved in the way we apprehend them. Here, the body has become an auxiliary instrument of vision in a dialogue between optical and haptic visuality, allowing us to transfer to the drawing the movements and tactility of the body of the person who draws it through a knowledge that is installed in the drawing formed by the experience of the real. And that led to different artistic works, demonstrating the ability of drawing to generate multiple responses to the same problem.

The doctoral research consists, in this sense, of an artistic project where drawing is both the research methodology and the result. The five projects developed: Desembarço (V.N Cerveira, Portugal 2017); A tenda (Barcelos, Portugal 2018), Tapumes (Porto, Portugal 2019), Polvo Compacto (Bilbao, Spain 2019), The Fence (Helsinki, Finland, 2018-2019) form situated studies that seek to describe this relationship in its uniqueness, pointing out for a modal dialogue between drawing embodied experience and space.

Keywords: Drawing, Hyperdrawing, Disposable architectures, Embodied experience, Cartography



4.6. Outras ações de disseminação

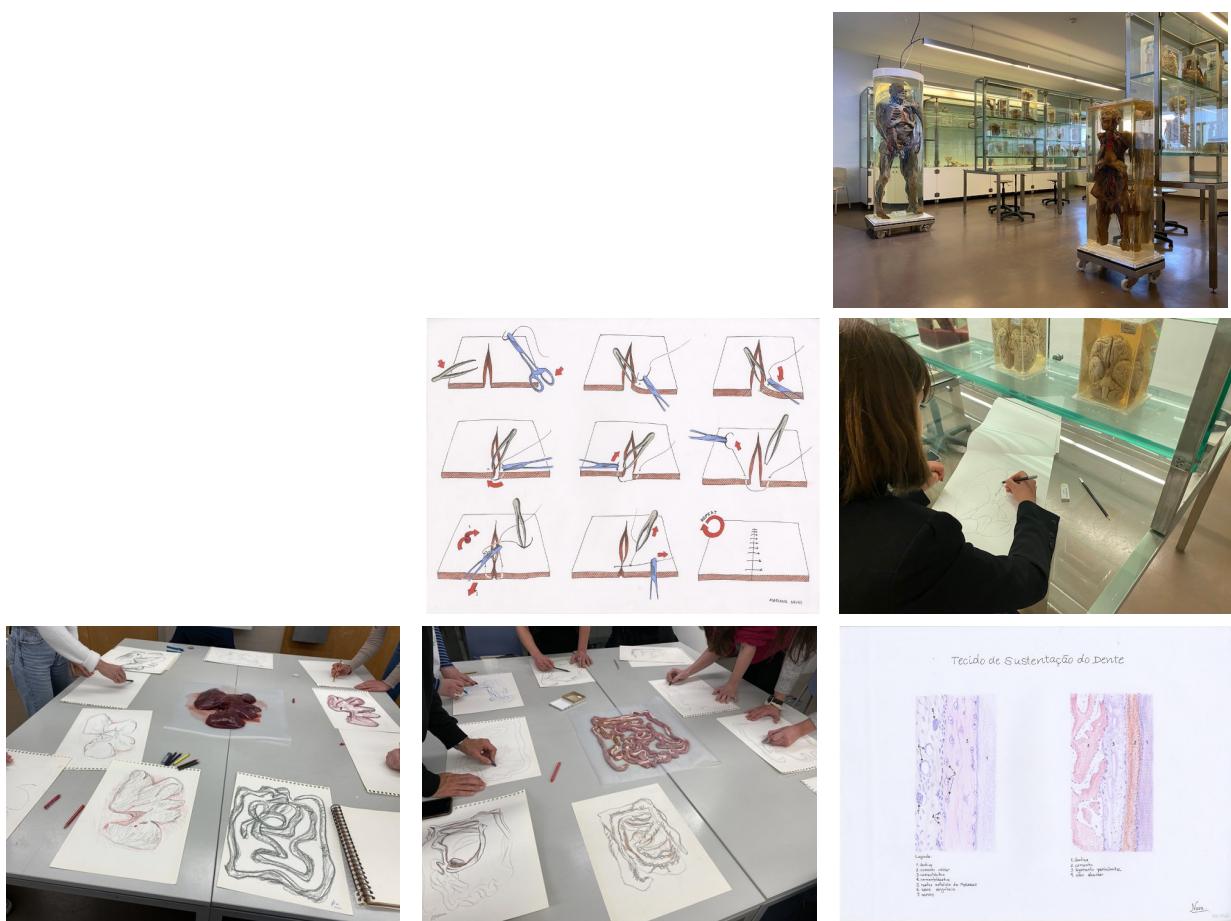
Workshops públicos

1. Drawing and Observation for Physicians (2th Edition) (15.02.2023 – 31.05.2023). Orientation by Marina Vale Guedes. Scientific supervision by Mário Bismarck. Faculty of Fine Arts, University of Porto, Porto, Portugal. Available at https://sigarra.up.pt/fbaup/pt/cur_geral.cur_view?pv_ano_lectivo=2021&pv_origem=CUR&pv_tipo_cur_sigla=UFC&pv_curso_id=25241
Number of participants: 22

Media: <https://www.researchcatalogue.net/profile/show-exposition?exposition=1874965>

Media: https://www.youtube.com/watch?v=Ea_2bi2spXs

SYNOPSIS: This course is a program specially designed for medical and dental students at the University of Porto. The program stems from the research work being developed by DRAWinU team within medicine and anatomy courses in the University of Porto, as way to develop an accessible, equitable and quality education based on drawing to address visual-spatial content within STEM areas. This curriculum challenges students to recognize the importance of drawing and its visual language as a learning tool to support their academic training. Considering that teaching in the context of medicine is based on the observation of the human body and the images that represent it, the practice of drawing can become useful not to understanding anatomy and as an important communication tool between doctors and patients. Understanding and communicating through their images helps to consolidate and complement cognitive and communication skills relevant to their training areas. The development of this curriculum is part of the DRAWinU R&D Project



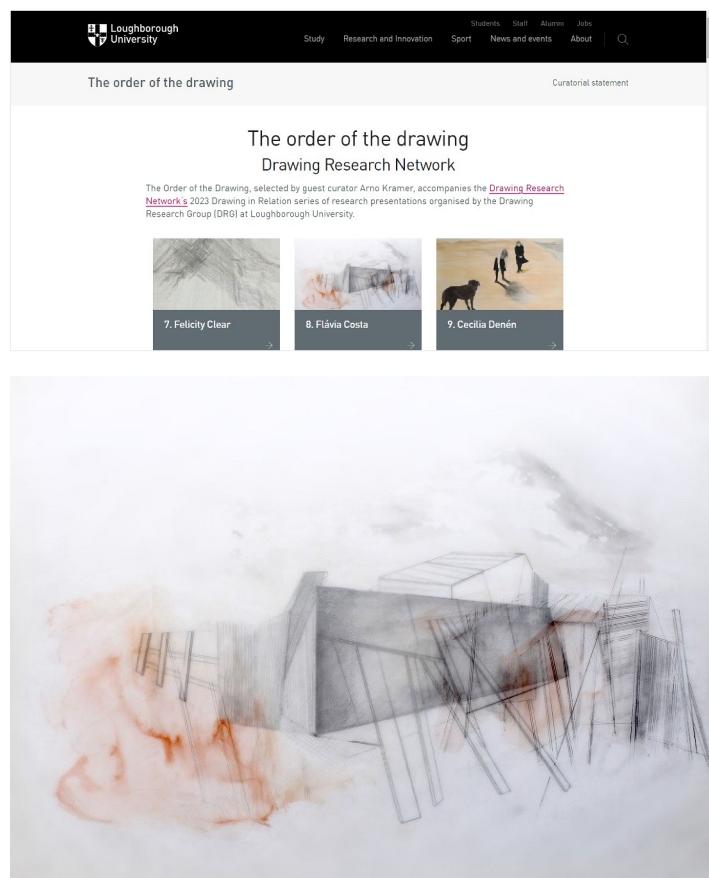
Exposições

1. COSTA, Flávia (21.08.2023 —). *Gipsy Drawings (Drawing I)* [Drawing]. In *The Order of Drawing* [online exhibition]. Curated by Arno Kramer. *Drawing in relation — Drawing Research Network Conference 2023*. Loughborough University.

Available at: <https://www.lboro.ac.uk/schools/design-creative-arts/the-order-of-the-drawing/8-flavia-costa/>
Media: <https://www.lboro.ac.uk/schools/design-creative-arts/the-order-of-the-drawing/>

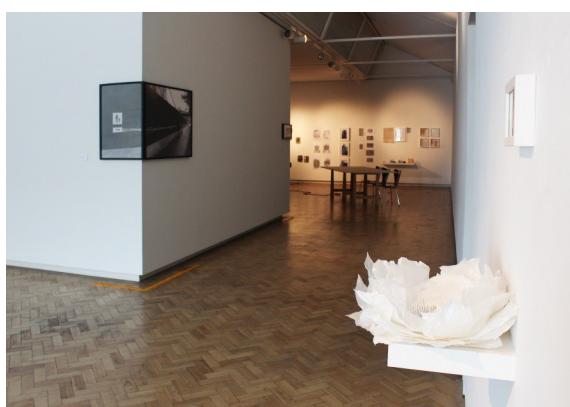
ABSTRACT: As part of the annual Drawing Research Network Conference, this online exhibition of drawing curated by artist and curator Arno Kramer, aims to explore the notion of ‘Drawing in Relation’. With this title “it is suggested that drawing can be considered relational; it is a means by which relations and the conditions through which they are created, maintained, and broken can be investigated. Connections are made between divisible surfaces, relations are engendered. In this way relations propagate and disseminate outwards.”

The Gipsy Drawings (Drawing I) follows the research process carried out in a practice-based PhD related with the relationships between the body and the city through its disposable structures and architectures.



2. COSTA, Flávia (20.09.2023 – 05-01.2024). *Sem Espaço* [Exhibition]. Curated by Paulo Luís Almeida. Research by Flávia Costa. Museum of the Faculty of Fine Arts, University of Porto.

ABSTRACT: This exhibition brings together the work developed during the doctoral research of Flávia Costa, focused on the potential of drawing in the representation of disposable architectures (a term coined by Allan Kaprow) in different territories: Portugal (V.N. Cerveira, Porto, Barcelos), Spain (Bilbao) and Finland (Helsinki). "Sem espaço" uses drawing as a strategy for visualising and modelling the sensitive experience of urban spaces in continuous transformation, crossing artistic research with the field of cultural geography and geographer Doreen Massey's notion of *thrown togetherness*.



4.7. ANEXOS

Atualização do plano de trabalho

WORK PACKAGE 1: PROJECT MANAGEMENT						
TASKS	ACTIVITIES	ACTIONS AND OUTCOMES	MONTH	RESPONS		
1	WP1. Project Coordination	WP1.1.1. Coordination with team and internal consultants WP1.1.2. Self-assessment of outcomes and methodology	Kick-Off Meeting / Progress Meetings Progression and Final Reports	1/6/18/24/30/36 12/24/36	PI CoPI	
WORK PACKAGE 2: IMPLEMENTATION AND DOCUMENTATION						
TASKS	ACTIVITIES	ACTIONS AND OUTCOMES	MONTH	RESPONS	MILESTONE 1	
2	WP2. Drawing Activities in Microbiology and Biochemistry	Literary Review Data Gathering ICBAS Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	PI	
3	WP2. Drawing in Natural Sciences	Literary Review Data Gathering FCUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	CA JM	
4	WP2. Drawing Activities in Mathematics	Literary Review Data Gathering FCUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	MHM	
5	WP2. Drawing Activities in Mechanical Engineering	Literary Review Data Gathering FEUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	SS	
6	WP2. Drawing Activities in Sports	Literary Review Data Gathering FADEUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	CoPI	WP 4. Research Book/Catalogue on Drawing STEM Exhibition [Month 11]
7	WP2. Drawing Activities in Territory Research:	Literary Review Data Gathering FCUP / FLUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	VC	
8	WP2. Drawing Activities in Architecture	Literary Review Data Gathering FAUP Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	VS	
9	WP2. Drawing Activities in Neurosciences	Literary Review Data Gathering IBS Interview with Educational / Research informants	Map of drawing research literature in key area Drawing Digital Data File, Technical File (D4) Video and Audio File (D3)	1-12 1-12 5	MML	
10	WP2. Scientific and Technical Management of Data	Video Recording and Editing Protocols Digital treatment and archiving of drawing files Transcriptions of interviews	Video File of Interviews Digital and Technical Files Transcriptions data file	1-12 5-16 5-16	CA JM	

WORK PACKAGE 3: DRAWING BASED RESEARCH						
TASKS	ACTIVITIES	ACTIONS AND OUTCOMES	MONTHS	RESPONS	MILESTONE 2	
11	WP3. Drawing Collaborative Labs in STEM areas	Development of drawing based practices for learning and research, targeting students, artists, scientists and general audience	Drawing Labs on STEM (D9) Drawing Lab Pedagogical Book (D10)	18-29 30	PI	
12	WP3. Drawing Research Practice between Art and STEM	Development of creative research methods Literature Review on Drawing between Art and STEM Post-Graduated Research Involvement	Documentation of the creative process (D8) Map of literature review (D8) Doctoral Thesis	18-30 18-29 13-26	PI/CoPI	WP3. Drawing Lab Pedagogical Book [Month 30]

WORK PACKAGE 4: DISSEMINATION AND PROMOTION OF KNOWLEDGE						
TASKS	ACTIVITIES	ACTIONS AND OUTCOMES	MONTHS	RESPONS	MILESTONE 3	
13	WP4. DRAWinU Website	Open Access resources	Public website creation (D11)	11	CoPI	
14		Kick-off Meeting	Public Presentation of DRAWinU (D1)	1	PI	
		Drawing in STEM	Exhibition on Drawing in STEM (D12) Seminar on Drawing in STEM (D12)	9 9	CoPI PI	
		Drawing Between Art and STEM (STEAM)	Research Book/Catalogue on Drawing in STEM (M1) Exhibition on Drawing Between Art and STEM (D13) Seminar on drawing between Art and STEM (D14)	11 31 32	CoPI CoPI	
		Consolidation of DRAWinU in national research networks	Research Book/Catalogue on STEAM drawing (D15)	35	PI/SS/VS	WP 4. International Conference on Drawing Across University Borders 2024 [Month 31]
15	WP4. Development of DRAWinU international Network	Publication in international journals with open access Participation in international Research Networks Advisory Board Organization of Final Conference on Drawing Across University Borders 2024	5 Paper submissions to national Journals (D16) 5 Paper Communication, nacional meetings (D17) 5 Paper submissions international Journals (D18) 5 Paper Communication in International Conferences (D19) Meeting (out/in) with external Consultant (D20) Proceedings (D21)	13-36 13-36 17-42 13-42 5/42 42	ALL ALL ALL ALL PI / CoPI CoPI/VC	

Researcher responsible for the activity/task

PI - Mário Augusto Bismarck Paupério de Almeida (Principal Investigator)
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ALL - All members of the Team

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SS - Silvia Patrícia Moreira Simões

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Atualização do cronograma



Project Reference: DOI 10.54499/PTDC/ART-OUT/3560/2021

Project

Project Acronym: DRAWBORDS
Project Title: DRAWING ACROSS UNIVERSITY BORDERS - Learning, Researching and Communicating through Drawing in the University

