

Title of the paper:

KNOWLEDGE AND PERCEPTION OF WOOD AND ENGINEERED WOOD PRODUCTS IN ARCHITECTURAL EDUCATION: A CASE STUDY OF ARCHITECTURE STUDENTS AT IBU

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Background and Research Aim

Engineered Wood Products (EWPs) are increasingly used in architecture due to their **structural performance, sustainability, durability, design flexibility, and aesthetic value.**

While their use in construction is growing in North Macedonia, their integration into **architectural education** remains limited.

This study examines **architecture students at the International Balkan University (IBU)** to evaluate their knowledge of EWPs.

Objective: Assess students' understanding of EWPs and identify opportunities to improve the architecture curriculum.

GLT Glulam-glued laminated timber	CLT Cross-laminated timber	PSL Parallel strand lumber	LSL Laminated strand lumber	LVL Laminated veneer lumber
				
EGP Solid wood panel	PB Plywood	LDF/MDF/HDF Low/medium/high-density fiberboard	VP Veneered particleboard	PB Particleboard
				
OSB Oriented strand board	LS Light sandwich (honeycomb) panels	WPC Wood plastic composites	TM Thermally modified timber	WFI Wood fibre insulation boards
				

Methodology

Research method: Online survey questionnaire.

Participants: 71 architecture students from all study levels at the Department of Architecture, Faculty of Engineering, International Balkan University (IBU).

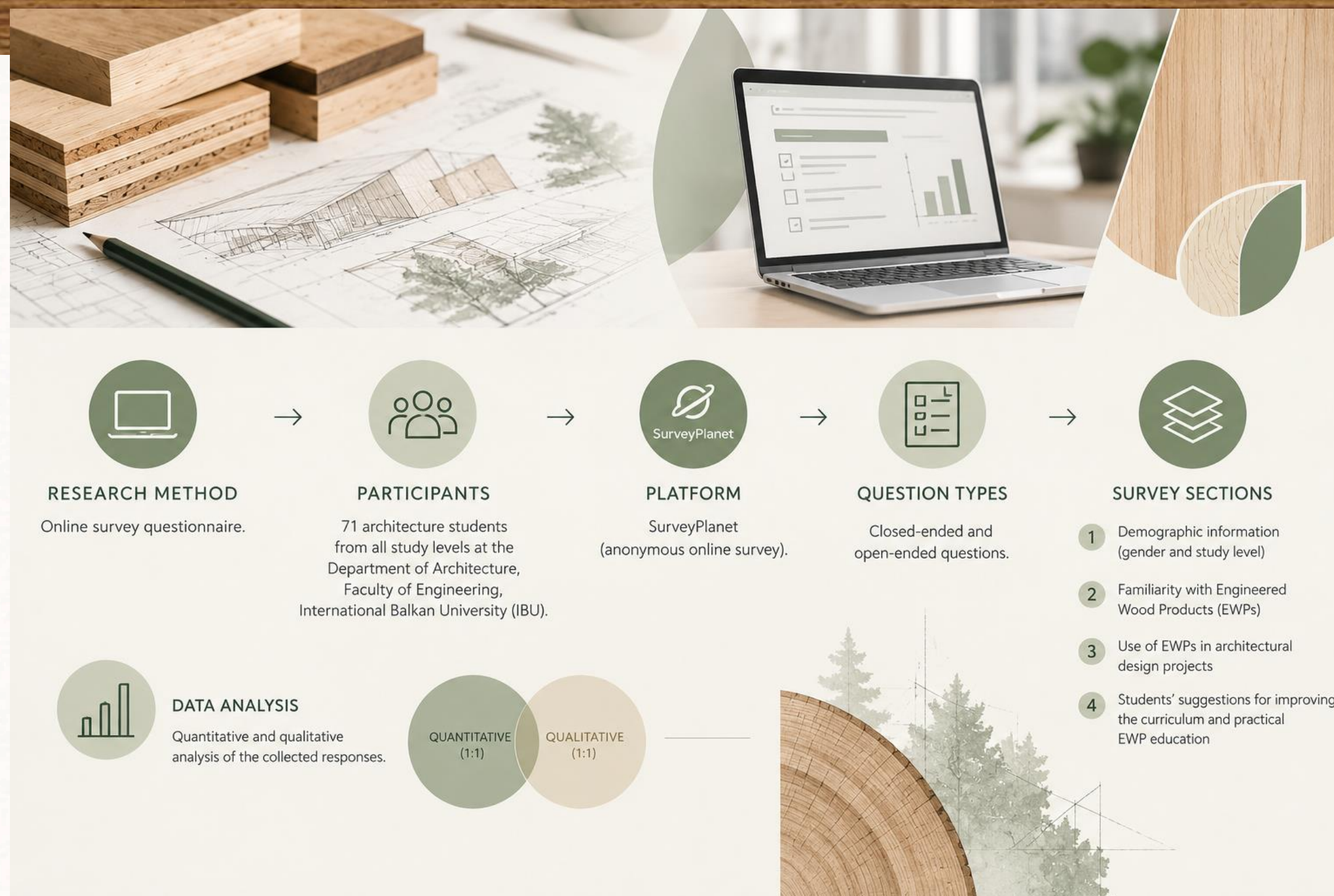
Platform: SurveyPlanet (anonymous online survey).

Question types: Closed-ended and open-ended questions.

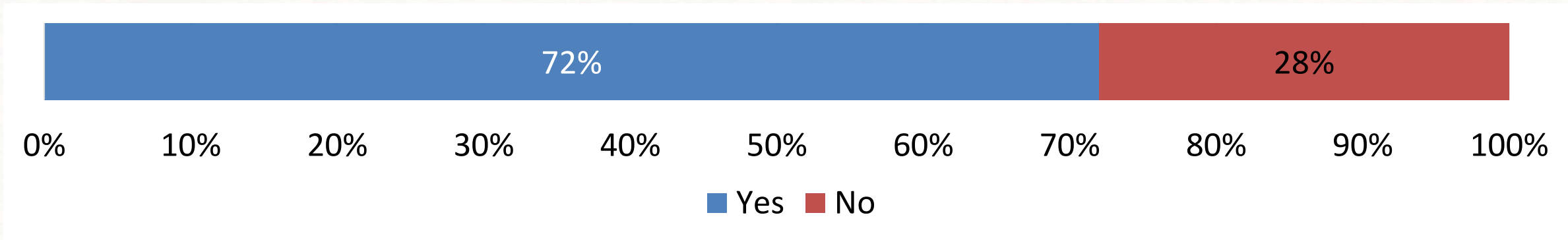
Survey sections:

- Demographic information (gender and study level)
- Familiarity with Engineered Wood Products (EWPs)
- Use of EWPs in architectural design projects
- Students' suggestions for improving the curriculum and practical EWP education

Data analysis: Quantitative and qualitative analysis of the collected responses.



Results and Discussion



Respondent familiarity with EWPs in general

	GLT Glulam-glued laminated timber 	CLT Cross- laminated timber 	PSL Parallel strand lumber 	LSL Laminated strand lumber 	SWP Solid wood panel 	LVL Laminated veneer lumber 	PW Plywood 	LDF/MDF Low/medium/ high-density fiberboard 	VP Veneered particle board 	PB Particle board 	OSB Oriented strand board 	LS Light sandwich panel 
Yes	45	44	15	12	40	16	43	37	8	9	13	23
	63%	62%	21%	17%	56%	23%	61%	52%	11%	13%	18%	32%

Respondent familiarity with specific EWPs

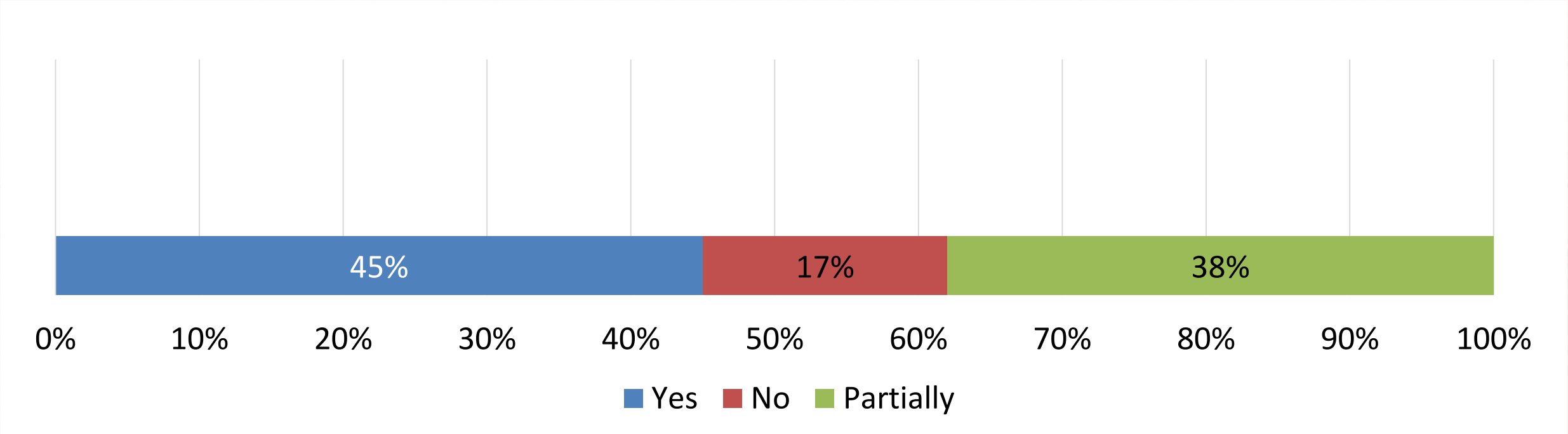
	GLT	CLT	PSL	LSL	SWP	LVL	PW	LDF/MDF/HDF	VP	PB	OSB	LS
ranks	1	2	8	10	4	7	3	5	12	11	9	6

Respondent familiarity with Top 5 Ranked EWPs

Results and Discussion



Respondent application of EWPs in their projects within architectural courses



Sufficiency of the knowledge gained at university about wood and EWPs for practical application

Results and Discussion

Year of Study	Course	Main Focus
2nd Year	Statics	Structural analysis and equilibrium
2nd Year	Architectural Structures I	Basic structural systems
2nd Year	Strength of Materials	Material behavior and structural safety
2nd Year	Architectural Structures II	Floors, roofs, stairs, construction methods
3rd Year	Architectural Structures III	Steel, timber, prefabrication
3rd Year	Theory of Structures I	Structural analysis and behavior
3rd Year	Building Physics	Thermal performance and sustainability
3rd Year	Building Materials	Construction materials and applications
4th Year	Reinforced Concrete	Concrete structural design
4th Year	Steel Structures	Steel design and connections
Master's	Architectural Structures IV	Contemporary structural systems & Eurocodes

Results and Discussion

Year	Material used for the structural system				Material used for façade
	Concrete	Steel	Timber / EWP	Other	Timber applied to the façade
2020	67%	33%	0%	0%	11%
2021	43%	57%	0%	0%	29%
2022	43%	14%	43%	0%	57%
2023	50%	29%	21%	0%	50%
2024	22%	56%	22%	0%	56%
2025	11%	56%	33%	0%	56%

Share of materials used by students in the structural system and in facades. Results from the Architectural Structures project course at the master’s level between 2020 and 2025.

Results and Discussion



Student project for Botanical Garden in Skopje – application of a CLT structure, designed by Faton Kalisi

Results and Discussion



Back Elevation



Front Elevation



Side Elevation



Side Elevation



Student project for Pavilion in Skopje – application of a CLT structure, designed by Eldin Fazliu

Results and Discussion



Students' project for Pavilion in City Park, Skopje – designed by Qani Saiti, Arman Kaçaniku, and Seadin Zendeli

Conclusions

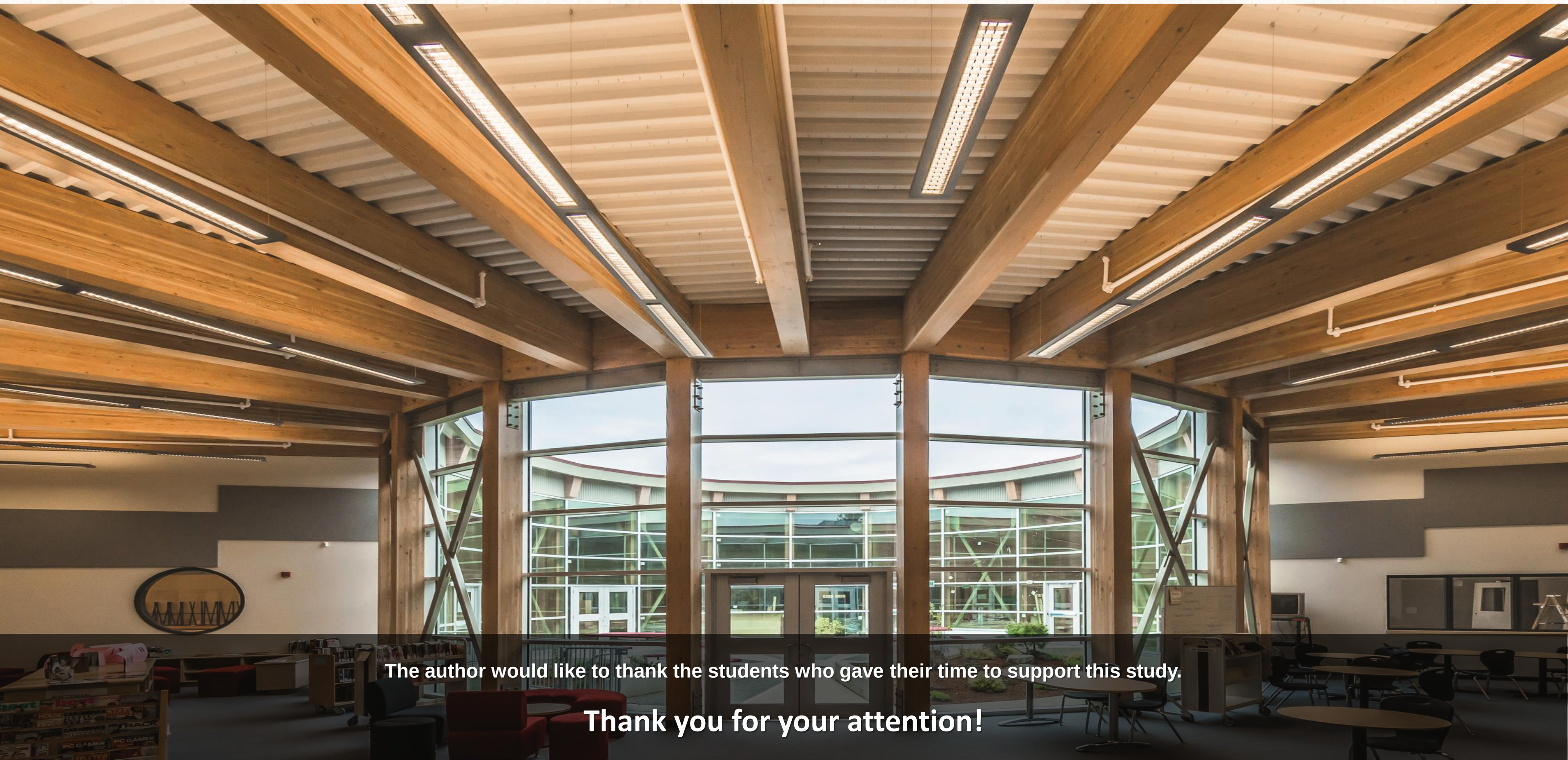
- **High awareness of EWPs** – 72% of students are familiar with engineered wood products.
- **Theory–practice gap** – timber and EWPs are present in the curriculum, but their practical application remains limited; **31% have never used EWPs in their projects.**
- **Limited practical preparedness** – only **45%** feel sufficiently prepared to apply EWPs in practice.
- **Demand for further education** – **56%** of students would like additional education on wood and EWPs.
- **Need for hands-on learning** – workshops, site visits, case studies, laboratory work, and project-based application should be strengthened.
- **Technical knowledge needs improvement**, particularly in detailing, durability, fire and moisture resistance, and sustainability.
- **Professional practice influences education** – the dominance of reinforced concrete and steel in North Macedonia limits students' exposure to timber construction.
- **Curriculum development** should strengthen timber/EWP education and collaboration with industry.
- **Future research** should compare other architecture programs in North Macedonia and universities in countries where timber and EWPs are more widely used.





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Thank you for your attention!